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THE UNIVERSITY OF ALBERTA

PUPIL CHARACTERISTICS AND TEACHER-PUPIL DYADIC INTERACTION

BY

ⓒ JAMES H. FASANO

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Pupil Characteristics and Teacher-Pupil Dyadic Interaction submitted by James H. Fasano in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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Date June 23..1977

ABSTRACT

The purpose of this study was to examine the relationship between pupil characteristics and dyadic interaction.

This study was part of a group approach to the study of teaching carried out in Western Canada by six researchers in the spring of 1976. The sample consisted of one grade one class, one grade three, and one grade six, in each of two schools. A preparatory phase in non-study schools, familiarization in the classes involved, and two weeks of classroom observation were followed by collecting data from school records and administration of self-report instruments.

Pupil age, sex, socioeconomic standing, sibling position, and family integrity, were examined in a canonical correlation with twelve dyadic interaction variables obtained from the modified Brophy-Good system. Significant correlations were found in two classes and approximately eighty percent of the variance in interaction was accounted for. Pupil sex was identified as the best predictor of the set.

Pupil ability, prior knowledge, self-esteem, attitude to school, and sociometric status, accounted for approximately ninety percent of interaction variance as five of six class canonical correlations were significant. Different variables were best predictors at different grade levels;

however, sociometric status and self-esteem were more prominent at grades one and three, while ability and prior achievement were more salient at the grade six level. The correlations between the best predictor pupil characteristics and the interaction variables were also examined.

The ten pupil characteristics previously discussed and two overall measures of pupil classroom behavior obtained from Spaulding's CASES instrument were examined in canonical correlations by grade, and accounted for approximately seventy-five percent of the variance in the dyadic interaction variables.

In the canonical correlations carried out in this study, a fairly high proportion of the common variance in teacher-pupil interaction was predictable from knowledge of pupil characteristics. In spite of possible instability due to sample size, these findings tend to support the belief that pupil characteristics evoke differential teacher response.

In order to assess some of the instruments used in this project, the pupil responses to the Oral School Attitude Test, Written School Attitude Test, Self-Esteem Inventory, and My Class Inventory were factor analyzed and test-retest data were obtained.

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Fellow graduate students Wally Eggert, Bob Mahen, Peter Moody, Dave Muttart, and my office mate Perc Marland, as research partners and friends, are without equal.

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CHAPTER 1

INTRODUCTION

> Works by Jackson and his colleagues have shown that some students interact very frequently with their teachers, while other students rarely do, and that some students are objects of their teacher's affection and interest, while others provoke mere indifference or even hostility. This led us to focus on the individual student as the object of analysis in our classroom research (Brophy and Good, 1974, p. vii).

This study addresses itself to the pupil, his characteristics, and the dyadic interactions he experiences with his teacher. The need for studies focusing on the pupil is emphasized by the fact that:

> . . . remarkably little research focusing on the individual student has been done. In fact, until very recently, there was practically no research focusing on the individual student in everyday, ordinary classrooms (Brophy and Good, 1974, p.vii).

Interest in the pupil has been accentuated in recent years by such publications as Rosenthal's (1968) "Pygmalion in the Classroom," P. Jackson's (1968) "Life in Classrooms," and John Holt's (1964) "Why Children Fail." As well, within the study of teaching, this emphasis on the pupil:

> . . . represents part of a much broader recognition by psychologists and educators that teacher-student interaction, and adult-child interaction generally, is a two-way street. This always has been recognized of course, but most research, until very recently,

> has treated the adult as active and causal and the child or student as reactive and as being shaped by the behavior of the adult. Researchers in education, child development, socialization and other fields where adult child interaction is important, have come to see that individual differences in children provide differential opportunities and limitations for the adults who deal with them (Brophy and Evertson, 1976b, p. 3).

A number of the student characteristics examined in relation to dyadic classroom interaction have only recently been examined, if at all. The instruments used to obtain the pupil measures were examined closely, as was the research model, to determine their utility in subsequent studies of teaching in naturalistic settings. As such, this study is viewed as an exploratory, hypothesis generating study.

The study had its beginnings in the fall of 1975, when a doctoral seminar focused on the 1973 Travers' Second Handbook of Research on Teaching. A discussion of group research versus individual research, and subsequent examination of chapter five, "The use of direct observation to study teaching" catalyzed a group research project carried out in the spring of 1976. This study, focusing on the pupil, represents one segment of that intensive, in-depth study of six elementary classrooms by six researchers including this writer: (Eggert, Fasano, Mahen, Marland, Moody, Muttart, 1976), an attempt to better understand "What is."

FOCUS OF THE STUDY

The Problem

What is the relationship between pupil characteristics and teacher-pupil dyadic interaction?

Sub-Problems

(1) To what extent are such pupil formative experiences as

SES
age
sex
sibling position
family integrity

predictors of teacher-pupil dyadic interaction?

(2) To what extent are such pupil properties as

ability
prior knowledge
self-esteem
attitude toward school
sociometric status

predictors of teacher-pupil dyadic interaction?

(3) What proportion of variance in teacher-pupil dyadic interaction is accounted for by pupil formative experiences, pupil properties and by pupil classroom behavior?

(4) What proportion of variance in pupil classroom behavior is accounted for by pupil formative experiences, pupil properties and by teacher-pupil dyadic interaction?

(5)"Did the Oral School Attitude Test, Written School Attitude Test, Self-Esteem Inventory and the My Class Inventory exhibit factors similar to the underlying dimensions described by the original author?"

(6) "Did the Oral School Attitude Test, Self-Esteem Inventory and the My Class Inventory exhibit test-retest reliability similar to values reported by the original author?"

Definition of terms

Pupil characteristics. This term refers to a pupil's distinguishing features or qualities; his attributes or traits. In this study, pupil characteristics will be considered to be composed of both formative experiences and properties.

Pupil formative experiences. This term refers to experiences in a child's early development that have shaped him, e.g., sex, socio-economic status.

Pupil property. This term refers to an essential or distinctive attribute or quality of a person, e.g., social behavior, prior knowledge.

Dyadic classroom interaction. The concept, dyadic classroom interaction, refers to those classroom interactions in which the teacher is dealing with a single individual child.

Coping behavior. This type of behavior includes actively confronting problems, showing independent initiative in seeking solutions, and displaying persistent effort to arrive at solutions.

Steering group. A group of pupils of a particular level of ability that classroom instruction is geared toward.

Facet. A set of categories that form a clear, mutually exclusive set, that is, all examples of the events in which the investigator is interested, can be coded into one of them.

Related terms. (i) Presage variable: This term refers to general aspects of personality as well as certain specific beliefs and attitudes. (ii) Process variable: This term refers to the actual activities of classroom teaching: all of the observable behaviors of teachers and pupils--what teachers and pupils do in the classrooms. (iii) Context variable: This term refers to conditions to which teachers must adjust, e.g., pupil characteristics, the community, the school. (iv) Product variable: This term refers to those changes that come about in pupils as a result of their involvement in classroom activities with teachers and other pupils.

DELIMITATIONS

The study did not attempt to examine teacher-whole class interaction; only the frequency of teacher-pupil dyadic interaction in Language Arts was examined.

The study did not attempt to develop new instruments to measure salient variables.

Factor analysis of pupil self-report instruments was limited to the Oral School Attitude Test, the Written School Attitude Test, the Self-Esteem Inventory and the My Class Inventory.

Test-retest reliability as calculated only for the My Class Inventory, the Self-Esteem Inventory, and the Oral School Attidue Test.

Literature reviewed for this study was limited to characteristics examined in relation to naturalistic studies.

LIMITATIONS OF THIS STUDY

The data collected in this study provided a detailed description of the interaction of 157 pupils with their teachers over a two-week period. The richness of such an intensive non-random study is restricted however in generalizability due to sample size and time of the year.

Other variables such as achievement motivation, locus of control and creativity were considered for inclusion in the sutdy, but instruments were either non-existent or the assessment methods were impractical in the time available.

The confidence one may express regarding the data collected is limited by the instrumentation. Possible inaccuracies on student record cards, current controversies regarding the misuse of ability measures, standardized test results and self-report data, all underline the need for caution in interpreting the data.

The presence of an observer in the classroom raises the possibility that the teacher and pupil behavior witnessed may not be typical of their unobserved day-to-day behavior. The presence of the investigators in the classroom for a week prior to coding, as well as a two-week observation period, represent attempts to minimize observer effect.

ORGANIZATION OF THE THESIS

This study is reported in six chapters. The present chapter introduced the topic of pupil characteristics and their relation to teacher-pupil dyadic relationships as well as a statement of the research questions.

The review of literature is reported in chapter two. An initial section examines the status of the Study of Teaching and is followed by the literature more specific to this study. Chapter three describes the design of the study, the sample, instrumentation, and methodology employed. An outline of the key statistical analyses is provided.

Chapter four reports the results of the primary analyses encompassed in research questions one to four. Chapter five, the secondary analysis, examines research questions five and six.

The concluding chapter, chapter six, is a summary of the study and includes conclusions, implications, and recommendations.

CHAPTER 2

RELATED LITERATURE: THE STUDY OF TEACHING*

INTRODUCTION

> What do we really know about teaching? Young people who are about to become teachers are anxious to acquire the substantive knowledge of their chosen field; those who are already teachers would like to improve their skills; and teacher educators would like to supply both with knowledge that has been verified through rigorous research. Unfortunately most of these persons will be disappointed in their search for knowledge. Most of the questions they will ask have yet to be studied at all, and much of the research on teaching conducted so far does not provide adequate answers (Dunkin and Biddle, 1974, p. 11).

How could six decades of effort and more than 10,000 studies not have examined most questions and provided more adequate answers? How can Rosenshine (1976) describe this field as new and sparse, while Gage (1960) refers to its literature as overwhelming and unmanageable? Dunkin and Biddle (1974) describe research on teaching in a kindly manner as "a young science," while Rosenshine and Furst (1973), not so kindly, describe it as "chaotic, unorganized and self-serving." This variant mix of optimism and pessimism is a shock for those looking for definitive, immediate pay-off.

---

* Parts of this review were originally prepared by this writer for Eggert, et. al. 1976.

THE BEGINNINGS

The results of Teacher Effectiveness studies were described by The Committee on Criteria of Teacher Effectiveness of the American Research Association (1953) as follows:

> The simple fact of the matter is, that after 40 years of research on teacher effectiveness during which a vast number of studies have been carried out, one can point to few outcomes that a superintendent of schools can safely employ in hiring a teacher or granting him tenure, that an agency can employ in certifying teachers, or that a teacher education faculty an employ in planning or improving teacher education programs (AERA, 1953, p. 57).

It is important to note, however, that the research referred to above occurred prior to 1957, the date which educational historians use to differentiate between the earlier "teacher effectiveness studies" and the present "study of teaching," now based to a greater degree on direct observation of teaching. This "modern era" had its beginnings in the late nineteen fifties with the work of Flanders, Medley and Mitzel (Dunkin and Biddle, 1974; Rosenshine, 1976).

Dunkin and Biddle (1974) considered the earlier teacher effectiveness research to be lacking in four major ways:

1. Researchers attempted to establish relationships without observing teaching activities. Gage (1963) referred to this as the Black Box approach to research on teaching.

2. The early research suffered from theoretical im-

poverishment; that is, in most cases there was little or no rationale provided for the inclusion of a particular item.

3. Rather than employing pupil learning or an affective change as a criterion, inadequate measures of effectiveness were employed such as supervisor ratings of effectiveness.

4. Early studies operated on the assumption that an effective teacher was always, and in all situations, an effective teacher. A concern for contextual variation could provide assistance in interpreting variation in teacher effect.

In the second half of the nineteen sixties and early seventies, teaching, with its weak and unproductive research base, was assailed by the genetic-environmental determinists. Coleman et. al. (1966), Jencks (1972), and Mayeske et. al. (1973), have been part of a movement to attribute variance in student achievement to "non-school" factors, contending that teachers do not make a difference; for example:

> . . . there is considerable evidence that "non-school" factors may be more important determinants of educational outcomes than are "school factors." There is good reason to ask whether our educational problems are, in fact, school problems (Averch, Carroll, Donaldson, Deecling and Pincus, 1971, p.xii).

Dunkin and Biddle (1974) point out that the comparison of school means to achievement by Coleman masked individual teacher effect. That is, since most schools feature a range of capable and less capable teachers, the effects of individual teachers cancel each other when a school mean is taken. A recent article by Berliner (1976) notes that most studies to date focus on language arts and social studies, two subjects which show the effects of home influence. As a means to observe teacher effect, he suggests studying achievement in subject areas such as a second language, specific sciences, etc., where home influence would be less likely a factor. Featherstone (1973) taking a different tack, suggests that:

> . . . the research that has been done does not show that schools make no difference. What it does show is that by certain crude measures schools are very similar to one another (Featherstone, 1973, p. 448).

In spite of the acknowledged weakness of research on teaching, and notwithstanding those who would attribute variance in school achievements to "non-school" factors, interesting counter trends may be found in the competency based teacher education and accountability movements. Berliner (1976) dismisses these movements with dispatch when he states:

> Unless replicable findings relating teaching behavior to student achievement in natural classroom settings can be found . . . [such programs] will not be believable (Berliner, 1976, p. 5).

How is it possible to meet Berliner's challenge when less than one percent of educational expenditures are designated for research. The number of researchers involved in the ongoing study of teaching numbers less than a dozen, and there have been fewer than twenty five studies on any single variable (Rosenshine, 1976). This underfinanced, undermanned research effort is minimal when compared to society's efforts in other fields; however, the demands for concrete findings continue to increase. The fact that research on teaching to date raises more questions than it provides answers should be no surprise under such circumstances.

THE CURRENT SCENE: RENEWED OPTIMISM

Rather than continually dwelling on the shortcomings of the current research base of teaching, there is also reason for optimism. The fact that so few researchers, working with very limited resources, provided the basis for Rosenshine and Furst (1971, 1973) to complete a comprehensive review of teacher effects is encouraging. As a result of their examination of approximately fifty-one naturalistic studies, they identified a principal set of five teacher behaviors construed to have a basis in research, and a secondary set of six behaviors judged to have weaker support (Kennedy and Bush, 1976). That is, these variables "have yielded the most significant and/or consistent results" (Rosenshine and Furst, 1973, p. 155). As a caution, however, Heath and Neilson (1974) are very critical of the Rosenshine and Furst review, while Jackson (1976) is critical of the Heath and Neilson review. Clearly a research base is developing, but the identification of effective teacher behavior remains in the future.

A second source of optimism is the enunciation by Rosenshine and Furst (1973) of a model for studying teaching in naturalistic settings. While providing an overall strategy for future studies, the paradigm also helps to place in perspective the different types of studies that have occurred to date. The model contains at least three elements:

1. The development of procedures for describing teaching in a quantitative manner.
2. Correlational studies in which the descriptive variables are related to measures of student growth.
3. Experimental studies in which the significant variables obtained in the correlational studies are tested in a more controlled situation.

The studies conducted at the University of Canterbury in New Zealand illustrate the use of this model for long term research as Nuthall (1971) recommends:

> . . . the results of the correlational and experimental studies be used to suggest and modify further descriptive, correlational and experimental studies. . . . In the final stage, explanatory theory is developed which accounts for the relationships uncovered in experimental studies (Nuthall, 1971, p.3).

An assumption basic to the implementation of such a loop is the support of an investigative team over several years. This would facilitate thematic continuity, accumulation of related findings and more rapid methodological refinement, all currently seen as desirable but very difficult when so much of our research is of the "one shot" variety.

Another source of optimisim is identified when Rosenshine and Furst (1973), Dunkin and Biddle (1974) and Nuthall (1968) all call for a moratorium on the development of new category systems in a manner somewhat as follows:

> Given the large number of existing variables and the small number of published studies, it seems appropriate to test these variables against measures of student learning before developing additional observational instruments (Rosenshine and Furst, 1973, p. 165).

This suggestion, in conjunction with the recommendation of Dunkin and Biddle (1974) and Flanders (1974) that future studies use multifaceted observational instruments, would permit operational definitions to stabilize and make replication possible while using the most complex instruments available.

Rosenshine and Furst also believe it seems unwise to limit research to a single observational system or type of system. They see the optimal strategy at this point to be to use a variety of existing instruments in every study, some that include broad items and rating scales (high inference), others that encompass narrowly focused items and category systems (low inference). They feel, though, there is a danger of losing potentially useful data through the combination of a number of variables into ratios, composites and clusters. To overcome this they suggest:

> In the first step the investigator could develop his hypotheses and parsimoniously select a limited number of variables for statistical analysis. In the second step, hundreds of variables could be formed from the data and subjected to analyses (Rosenshine and Furst, 1973, p. 170).

An encouraging advance is represented by Dunkin and Biddle's (1974) The Study of Teaching, an intensive review of one hundred and seventy-eight studies that have involved classroom observation. There appears to be more research focusing on the actual instruction in the classroom, that is, what the classroom is and what it accomplishes. Findings generated in such studies will have greater generalizability than lab studies even though it will be more difficult to establish cause and effect relationships (Brophy and Good, 1974).

Such field surveys will fulfill the aims of Rosenshine and Furst's (1973) descriptive, correlational phases of the research loop. Such initial exploration, in providing the opportunity to refine theories, instruments, etc., will lay the groundwork for the related, but more controlled, experiments to follow.

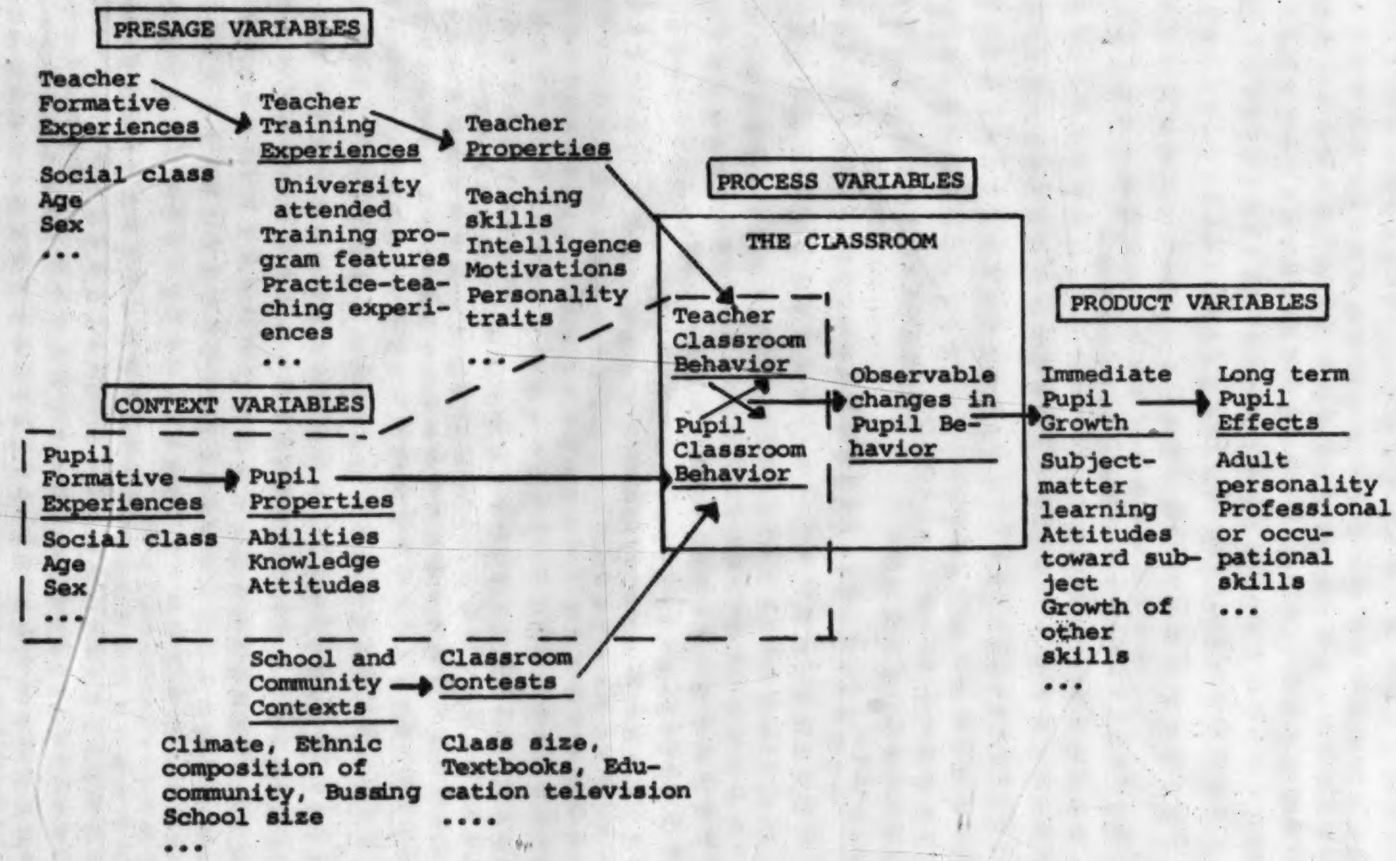
Within the Dunkin and Biddle review, a model is presented (Figure 1) which the authors feel may serve to build an integrative theory of teaching. The model permits teacher and pupil characteristics (presage variables), teacher and pupil classroom behavior (process variables), school and community characteristics (context variables), and a variety of outcome measures (product variables), to be examined in relationship to one another using multivariate designs.

Dunkin and Biddle suggest that investigators should utilize designs that pair process information (teacher and pupil behavior) with presage, context or product variables. This recommendation, supported by Brophy and Evertson (1976a, 1976b), Brophy and Good (1974), forms the cornerstone of this study. The study, shown on figure 1 by the area enclosed by dashes, examines the relationship between dyadic classroom interaction (process information) and pupil characteristics (pupil presage or context).

THE PUPIL AND CLASSROOM PROCESS

> Jackson (1968) showed in his book Life in Classrooms that inequality is the rule rather than the exception for teacher-student interactions in the same classroom. Some students have a great many interactions with their teachers every day, while others see the teacher less than once a week. Some are frequently criticized or disciplined, and still others are mostly ignored. Jackson's observations about the uneven patterns of teacher-student contact in classrooms have been supported by the work of many others . . . . (Brophy and Good, 1974, p.30).

Figure 1. A model for the study of classroom teaching


PRESAGE VARIABLES
Teacher Formative Experiences
Social class
Age
Sex
...
Teacher Training Experiences
University attended
Training program features
Practice-teaching experiences
...
Teacher Properties
Teaching skills
Intelligence
Motivations
Personality traits
...
PROCESS VARIABLES
THE CLASSROOM
Teacher Classroom Behavior
Pupil Classroom Behavior
Observable changes in Pupil Behavior
PRODUCT VARIABLES
Immediate Pupil Growth
Subject-matter learning
Attitudes toward subject
Growth of other skills
...
Long term Pupil Effects
Adult personality
Professional or occupational skills
...
CONTEXT VARIABLES
Pupil Formative Experiences
Social class
Age
Sex
...
Pupil Properties
Abilities
Knowledge
Attitudes
School and Community Contexts
Climate, Ethnic composition of community, Bussing
School size
...
Classroom Contests
Class size, Textbooks, Education television
....

What are the determinants of such diverse treatment? Part of the answer will be in research focused on the individual pupil in ordinary classrooms. Brophy and Good state that until recently there has been practically no such research, one possible reason that educational research has not provided teachers with more knowledge to apply in the classroom. They feel such research is sorely needed and encourage other researchers to pursue this approach.

Brophy and Good (1974), Brophy and Evertson (1976a, 1976b) focus both on the pupil and on his classroom interaction. As a result the authors suggest the patterns of interaction described above by Jackson (1968) could be due to the fact that classroom interaction normally occurs at a rate not permitting most teachers to consciously monitor each individual and thus the teacher is unable to maintain his proactive stance. Rather, teachers become reactive or unconsciously conditioned in their responses to pupils. That is, students' individual differences will affect teachers for better or for worse and are the key to understanding differences in teacher-student interaction (Brophy and Good, 1974). The following sections will review a number of variables that are recommended for examination in relation to classroom interaction. Dunkin and Biddle state that only a handful of naturalistic studies have examined these variables. They speculate that perhaps some may turn out to be irrelevant, some will provide minor input, while others will turn out to generate substantial variation in teaching.

PUPIL CHARACTERISTICS

Sex. Of all the variables that can be used to divide people into groups, sex is probably the most fundamental and pervasive (Brophy and Good, 1974, p. 199). Overall, boys are more salient in the classroom (Silberman, 1969) as they are more assertive and aggressive in seeking and obtaining contacts with the teacher (Maccoby, 1966). They are less attentive and misbehave more (Brophy and Evertson, 1976b). Boys receive more praise than girls for both their work and behavior, and more criticism for their misbehavior. Boys call out more and are called on more regarding work. Boys are more variable than girls on almost any variable measured (Brophy and Good, 1974).

Girls volunteer more often and more enthusiastically, have their private interactions accepted by the teacher, and are more likely to receive sustaining feedback after a reading error (Brophy and Evertson, 1976b). In achievement, girls tend to be initially superior to boys, but this, as well as their greater orientation to the teacher, gradually disappears. The initial superiority of girls is attributed by Brophy and Good to culturally determined sex roles; that is, they are better suited to the more verbal, passive role of the pupil. It appears:

> There is reason to believe that girls are more compliant, more verbally developed and more sophisticated in communication, more likely to make reasonable or feasible requests and more likely to have completed their work when they approached the teacher for permission to do something else. Thus the differential teacher behavior may only represent response to differential student behavior. . . . (Brophy and Evertson, 1976b, p. 27).

Brophy and Good state, however, that this initial advantage for girls disappears due to overly restrictive sex role expectations as they get older.

These findings, although they represent patterns that appear to be emerging from the research, cannot be accepted without reservation pending further replication and careful interrogation of mixed findings.

Ability and prior knowledge. The importance of the child's level of abilities and knowledge in the subject matter area was emphasized by Ausubel (1963) who regarded both as important determinants of learning. With respect to ability Lundgren (1972) hypothesized that:

> . . . teachers geared their instructional effort at the students in the upper half of the lowest ability quartile in the classroom (Brophy and Good, 1974, p. 310).

Lundgren found that the average I.Q. of the steering group pupils varied inversely with the amount of teacher informing and disciplining.

A number of studies, ranging from Horn (1914) to Good (1970), present evidence that students of different achievement levels have much different kinds of interactions with their teachers. For example:

> The low group on the achievement scale had more total contacts with the teacher, more private contacts, and fewer whole class opportunities (Brophy and Evertson, 1976b, p. 39).

Low achievers, approaching a teacher to initiate a private work contact while the teacher was busy with another group, were more likely to be refused. No doubt this is related to the fact that, when this type of pupil is given feedback, it is more likely to be long feedback. Also, in general, low achievers receive more negative evaluation than high achievers.

Social class. Few studies have examined pupil social class in relation to classroom interaction. Where they do, the findings do not lend themselves to simple comparison. Brown (1969) and Brophy and Evertson (1976a) examined interaction in relation to an assigned school socioeconomic status. Using individual status ratings Friedman and Friedman (1973) found that significantly more total reinforcements and especially nonverbal reinforcements were given to middle class children. Brophy and Good (1974) noted more facilitative patterns with the higher class pupil.

Hoehn (1954) and Gobbert (1973), however, found no quantitative differences in teacher-student contact by social class, but there were qualitative differences.

Lower class students received more dominative contacts from the teachers while middle class peers received more supportive and integrative contacts. These socioeconomic differences disappeared when the analyses were controlled for achievement. They concluded that the teachers were responding primarily to achievement rather than social class.

Sociometric status. According to Dunkin and Biddle (1974) sociometric status as a variable has been ignored in naturalistic studies. Of the studies reviewed, only Medinnis (1962) examined this variable in relation to classroom interaction. He found that pupils who received more praise from the teacher tended to be pupils chosen more often by their peers in sociometric interviews.

Self-esteem. This variable has been widely used in research generally, yielding mixed results when examined in relation to a wide range of other variables. Its use in naturalistic studies has been minimal, and, as a result, little is known about the relationship between pupil self-esteem and teacher or pupil classroom behavior.

Attitude to school. Much like self-esteem, attitude to school has been popular in educational research but not studied in depth in relation to interaction. In more general studies, Good, Biddle and Brophy (1975) concluded that no simple relationship exists between this variable and achievement. Yee (1968) and Rosenshine and Furst (1973) report attitude scores decrease during a school year while Jackson (1968), Wirsing (1976) and Brophy and Good (1974) conclude that girls have more favorable attitudes than boys.

Sibling position. Romanoff (1976), and Kormelink (1976) are among the few who have examined this variable in relation to achievement. In general, findings are inconsistent and contradictory (Nield, 1976). Although Dunkin and Biddle (1974) recommend sibling position for study, Brophy is not optimistic regarding the eventual importance of this variable. He felt any relationship uncovered might be related to the fact that firstborns tend to be better socialized and independent in comparison to only children or last born children (Brophy, 1977, personal communication).

Age. Brophy and Evertson (1976a) report fewer questions and fewer sustaining responses by teachers in the lower grades. With increases in grade level, Brophy and Evertson (1976b) found that the number of times a pupil called out an answer increased but in more appropriate ways. The teacher called on more non-volunteers to answer questions, and classroom interaction became focussed on academics. Private interactions dropped as did managerial and disciplinary contact. For example:

> . . . older students were more likely to be described as well behaved. This fits well with other research which suggests that students become increasingly well socialized to the student role across these age ranges 7-11 yrs. Students in the middle grades usually are more settled into school routines than students in the early grades, and they require less supervision because they are able to work independently for longer periods of time (Brophy and Evertson, 1976b, p. 29).

The same study reported that co-operative students received more public response opportunities, were called on more frequently for housekeeping jobs, and, if they misbehaved, were warned rather than criticized (Brophy and Evertson, 1976b, p. 58).

Pupil characteristics, such as those described in this section, are highlighted by Lerner when he states:

> An organism will evoke differential reactions in its socializing environment as a consequence of its own characteristics and these different reactions may certainly be expected to affect the organism's own development (Lerner, 1976, p. 37).

The view that a pupil will evoke differential teacher reactions as a consequence of his own characteristics, underlines the need to collect and analyze data based on the individual pupil (Rosenshine and Furst, 1973; Brophy and Good, 1973; Berliner, 1976) as well as to utilize class means where appropriate. For example, Brophy and Evertson (1976a, 1976b) utilized class means to good advantage in their studies; however, they also expressed the need to examine the interactions of teachers with individual pupils. The importance of individual pupil data is stressed as follows:

> It is possible to code the behavior of individual students in classrooms. The work has just begun, but at some point in time the collective results from numerous investigators studying individual students in the classroom may make it possible to elaborate more fully on the type of interaction milieus that facilitate the growth of students varying in age, sex, SES, aptitude and personal traits. It seems that future investigations focused on individual students' behavior will greatly expand our knowledge of classroom behavior and learning. Techniques for studying individual students now exist, it remains for future investigators to modify and expand such systems and to use them in imaginative ways (Brophy and Good, 1974, p. 326).

CONCLUSION

One conclusion that seems inescapable after reviewing the literature of the Study of Teaching is that educational researchers and teacher educators are going to have to learn to avoid making oversimplified and overgeneralized statements about particular teaching behaviors in the foreseeable future. Dunkin and Biddle feel that such individuals will have to be more systematic and careful in stating the circumstances that make a particular behavior appropriate or inappropriate.

Considering the mix of optimism and pessimism with the mass of related literature it would seem necessary in conclusion to place each in perspective. First Dunkin and Biddle in their cautious optimism state:

> Research on the process of teaching is already generating findings useful to educators. Most of the evidence of this advanced so far is suggestive rather than definitive. Some of it concerns notions for the improvement of teaching that don't appear to work; some of it presents evidence for ideas that do. Some of the conclusions reached are tentative because studies of crucial relationships have not yet been conducted, because of limited samples, or because evidence from field surveys has not yet appeared by way of theoretical integration for this field, although the outlines of theories can be discerned. But scores of variables for describing classroom events are now available from this research for which literally hundreds of suggestive findings have been developed (Dunkin and Biddle, 1974, p. 418).

Rosenshine and Furst (1973), although they would agree with much of the preceding statement, and inspite of their many suggestions for improving research, find it necessary to end on a sad note as they conclude:

> It is possible that the patterns of effective teaching for different ends are so idiosyncratic that they will never be isolated; it is possible that studying teaching in natural settings is unproductive because the settings are not functional for the desired outcomes; it is possible that descriptive systems and research within the descriptive-correlational-experimental loop will be unproductive. . . . At the moment there has not been enough research to make any firm statement about any of these concerns (Rosenshine and Furst, 1973, p. 175).

As one weighs the optimism and the pessimism within the literature of the "Study of Teaching," the presence of both is understandable as both faith and skepticism would seem to be required.

CHAPTER 3

METHODOLOGY

The main purpose of this study was to examine the relationship between selected pupil characteristics and the dyadic interaction the pupil shared with his teacher. The purpose of this chapter is to outline the design and sample of this study, to describe the instrumentation and methodology employed and to present a summary of the statistical analysis.

THE DESIGN

This study is part of a large scale descriptive-correlational study of teaching and learning. The data to be examined in this study therefore carry both the advantages and limitations of the larger study. The body of literature related to the Study of Teaching contains a number of recommendations for improving this type of research. An attempt was made to consider and incorporate the following recommendations in the design of the study.

1. Research on teaching should be undertaken in the naturalistic setting, that is, in a classroom where the teacher and pupil normally function (Good, Biddle, and Brophy, 1975).

2. Variables for study should be collected using existing multifaceted instruments (Flanders, 1974).

3. High inference rating scales should be used in conjunction with low inference observational systems (Rosenshine and Furst, 1971).

4. Enough data should be collected to enhance the possibility of obtaining reliability and validity (Good, Biddle and Brophy, 1975).

5. A small number of teachers and classrooms should be studied to allow both extensive and intensive data collection, and both behavioral and introspective data (Brophy and Shulman, personal communication, 1975).

6. A variety of pupil measures should be obtained (Dunkin and Biddle, 1974).

7. Research into teaching must recognize that teachers teach individuals. Studies must by necessity focus on teacher-pupil dyadic relationships as well as teacher-group relations (Brophy and Good, 1974).

SAMPLE

The research sample sought initially consisted of pairs of grade ones, threes and sixes, in each of two randomly selected schools. Approaches were made to a number of schools, inviting them to participate in this project. A few teachers in a number of schools were willing to take part; however, due to constraints to time, manpower and cost, the first two schools in which one teacher at each desired grade level agreed to participate became the sample. As a result, the initial sample consisted of one hundred and sixty students and their six teachers. Three pupils were removed from this sample as they were not present for most of this study. The final sample therefore consisted of forty-eight grade ones, fifty-nine grade threes and fifty grade sixes, a total of one hundred and fifty-seven pupils.

The two schools that agreed to participate were located in neighboring residential areas of the same urban school jurisdiction in Western Canada.

INSTRUMENTATION

An early decision was made to use instruments that had already been used in previous studies. This decision was based on the suggestions of Nuthall (1968), Rosenshine and Furst (1973), and Dunkin and Biddle (1974) as a means of assisting inter-study comparisons, stabilization of operational definitions and accumulation of findings.

Classroom Interaction Instrument

The Brophy-Evertson modification (1973) of the Brophy-Good dyadic interaction observation system was the source of the teacher-student interaction data for this study. This system takes into account public response opportunities (academic, student-initiated questions or comments); teacher afforded contacts, including the principles of Kounin's (1970) classroom management variables; and child-created contacts (see Appendix A-1).

The Brophy-Good instrument is multi-faceted and of high reliability (Dunkin and Biddle, 1974). The 1974 work of Good and Brophy is cited as a particularly good example of the use of live observation meeting Dunkin and Biddle criteria. Dunkin and Biddle (1974) state that the use of recordings, such as audio and videotape recordings are favored; however, this would not be a method of choice in exploratory studies that are aimed at concept development, where the classroom events unfold over a period of days, weeks, etc., or where the coders are called upon to make simple judgements at an acceptable pace. Biddle, in the fall of 1975, identified the Brophy-Good instrument as one we should consider for our research (personal communication).

All the observation categories were used as defined by the authors with the exception of (i) a modification to "No feedback reaction"; (ii) the addition of two new categories: "Teacher affirmation" and "teacher repeats student's statement" (see Appendix A-2); (iii) the teacher-pupil interaction was recorded for each pupil, that is, each pupil was known to the coder by a number and this number was noted for each interaction observed. This represents an advance of the use of this instrument in the latest Brophy-Evertson studies (1976a, 1976b) in which the individual pupils were not identified and analysis was based on class means. Thus when a pupil's characteristics were examined in relation to classroom interaction, the data were specific to the interaction he/she shared with the teacher.

Pupil Formative Experience Instruments

Student record cards. The two schools involved in this study maintained individual student record cards that were updated each fall and provided the school with access to dependable information on each pupil. It was from these cards that such pupil formative experiences as age, sex, sibling position, father's occupation, other languages spoken at home, etc., were recorded.

Blishen scale. Socioeconomic status, S.E.S., is a widely used statistic and has been measured in a variety of ways. In some studies an S.E.S. value has been assigned to the school rather than to individual pupils; in others teachers have rated individual students. Alternate methods have included investigator rating of parent-reported appliances, educational materials, etc., in the home, or a check list system whereby a parent categorizes his occupation (Bryant, et. al., 1974).

In this study, the Blishen socio-economic index for occupations in Canada was applied to occupations stated on the student record card. When the information on the card was insufficient to assign a Blishen scale value, the teacher and/or student were approached for further information. As a result a measure of S.E.S. was obtained for each student.

Pupil Properties Instruments

Sociometric status. The first sociometric tests were originally devised by J. L. Moreno. The questions posed in this study (who would you like to sit near? work with? play with?) were suggested by Dinkmeyer (1965). During March 1976, the questions, protocols, etc., were tried and modified in rooms of a school not involved in the study. Grade one pupils were interviewed individually and they answered the sociometric questions with the aid of a chart displaying a picture of everyone in the room, a method suggested by Brophy (personal communication). Grades three and six pupils were posed the sociometric questions as a group, the names of all pupils in the room written on the board to reduce dependence on memory. The grade three and six pupils recorded their own responses on a form provided.

Pupil Classroom behavior. Spaulding's (1975) "Coping Analysis Schedule for Education Settings," CASES:

> . . . was developed over a period of approximately seven years as a result of more than 2,000 case studies of normal children in on-going public school classrooms, Head start centers, and other educational settings (Spaulding and Papageorgiou, 1975, p. 1).

Pupil behavior is coded into one of thirteen categories, six of which are subdivided into appropriate or inappropriate behaviors (see Appendix B-1). The data is collected separately for teacher directed and non-teacher directed settings. Eighteen of the nineteen categories, (all but "responding to internal stimuli") reflect the pupil's economy in dealing with the external environment, which for this system is considered:

> . . . to be of crucial importance in the development of his social relations and, ultimately, his overall cultural adequacy. . . . In its present form, CASES provides a comprehensive technique of characterizing overt coping behavior in the classroom (or any social setting) (Spaulding and Papegeorgiou, 1975, p. 2).

For both teacher directed and non-teacher directed settings, the categories are combined to produce coefficients representing eight "coping styles" based on personality development theory, and a composite score called the "Overall Cases Coefficient" (O.C.C.) (see Appendix B-4). This coefficient is a weighted ordinal scale to measure the student's overall success in coping with the educational setting. The higher the score on a scale from one to ten, the more successful the student. This overall coefficient is:

> . . . especially useful as a target variable since it is weighted to reflect cultural expectations in normal personality and social development. It has been found normally distributed and correlated positively with reading and vocabulary development (Spaulding, 1973, p. 4).

Inter-rater reliability is typically reported from .80 to .95. Spaulding and Papageorgiou state that construct validity is suggested by the ease with which teachers and others familiar with child development and personality theory have obtained reliability when trained to use the instrument. Also the observation categories, when learned by teachers, are easily identified by those teachers in terms of pupil behavior.

Additional instrumentation. The remainder of this instrumentation section will present, in chart form, the pupil characteristics that were measured by self-report instruments, measures of ability, and achievement tests.

Description of the Instrument	Basis of Selection
Oral School Attitude Test (Rivera) Administered by class to grades 1 and 3. Twenty-nine items requiring an X be placed on the face which best shows how they feel toward ______. Three factors: general school, student instruction interaction, interpersonal relations. (see Appendix C-1)	Test-retest reliability of .77. Author claims of item content validity, and availability in a format suitable for use with younger children.
Written School Attitude Test (McCallon) Administered by class to grade 6. Forty-six items, a check placed beside one of three alternatives. Three factors: general school, student instruction interaction, interpersonal relations. (see Appendix D-1)	Test-retest reliability of .78. Teacher judgement of content validity, available in a suitable format.
Primary Children's Attitude Scale (Barker-Lunn) Administered by class to grades 3 and 6. An X placed beside one of three alternatives on sixty-four items. Ten factors including attitude to school, importance of doing well, relations with the teacher, and anxiety in class. (see Appendix E)	Internal consistency of .69 - .91. Author claims of content, construct and predictive validity. Items derived from discussions with pupils, and care in outlining development.

Description of the Instrument	Basis of Selection
Metropolitan Achievement Test-Intermediate 363 items administered by class to grade 6. Yields reading and math grade equivalents, percentile and stanine ranks.	Split half-reliability .84 to .96. School administered the fall previous to this study.
Self-Esteem Inventory (Coopersmith) Fifty-eight items administered by class to grades 3 and 6, by small groups in grade 1. Pupil checked "Like me," "Not like me" (see note 1). Five factors: general self, social self-peers, home-parents, school/academic, lie scale. (see Appendix F-1)	Split half reliability .89, test-retest reliability .88, wide use in research.
Peabody Picture Vocabulary Test Administered (individually) to grade 1. A word is pronounced by the examiner, the pupil points to the appropriate picture. Yields an I.Q., percentile score and mental age.	Alternate form reliability .67, detailed reliability, validity and development information, feasible format for time available.

Note 1. The Coopersmith Self-Esteem Inventory was used as published for grades three and six. For grade one, however, rather than checking "Like me" or "Not like me" following a statement, the original statement was followed by a second statement opposite in meaning. Students then checked which statement applied to them. This permitted administration in groups of 8-10 as an alternative to testing individually.

Description of the Instrument	Basis of Selection
Lorge-Thorndike I.Q. test--Form 1, Level A Administered by class to grades 3 and 6. Yields verbal and non-verbal D.I.Q., age and grade equivalents, grade percentile, total D.I.Q.	Split half reliability--verbal .83-,95 and non-verbal .56-.68. Wide use as a group test.
Metropolitan Readiness Test --Form A Administered to beginning grade one classes in groups of 15. Child places a cross on the appropriate picture. Yields five readiness categories.	Split half reliability .90-.95. Author claims of content, predictive and construct validity. Test used by study schools the previous fall.
Metropolitan Achievement Test--Primary 2 Administered by class to beginning grade 3. Yields grade equivalents, percentiles and stanines for total reading and math.	Split half reliability .85-.96. Test used by the study schools the previous fall.
My Class Inventory Forty-five items are administered by class to grades one, three and six. Pupils indicate "yes" or "no" on items that are evenly divided into five categories of climate: Satisfaction, Friction, Competitiveness, Difficulty and Cohesiveness. (see Appendix G-1)	Scale test-retest reliabilities range from .54-.77, The items were derived from the Learning Environment Inventory developed for use with older children.

PROCEDURES

Preparatory Phase

Dyadic interaction data. Three of the six investigators were trained to use the Brophy-Evertson (1973) observation system over a period of one month using the following approach:

(1) The coding manual was studied and meanings of categories were discussed.

(2) Written transcripts of lessons were coded and categorization was compared and discussed.

(3) Live coding in non-study schools permitted further refinement in category definition as well as reliability checks. (See Appendix A-3a). During this time, tallying directly onto the coding sheets was determined to be difficult, particularly at lower grade levels as classroom interaction occurred rapidly. As a result the investigators were equipped with cassette recorders and microphones. Using the appropriate Brophy and Evertson categories, interaction was verbally coded onto tape and transferred to coding sheets (see Appendix A-4) each evening.

Pupil classroom behavior data. The three other investigators were trained to use Spaulding's (1975) "Coping Analysis Schedule for Educational Settings" over a period of one month as follows:

(1) The coding manual was studied and categories learned and discussed.

(2) For training purposes, a videotape of two pupils functioning in a classroom was obtained from Spaulding. A signal, at ten-second intervals, is superimposed on the tape to signify incidents to be coded. The manual provided accompanying explanations and codings of the pupil behaviors. Repeated coding of the taped behavior plus frequent reference to operational definitions produced an inter-rater reliability of approximately .75 (see Appendix B 2-a).

(3) Training in a live school setting continued over a two week period. A cassette audiotape connected to a three headset listening station emitted signals every ten seconds to standardize the time at which the three investigators coded pupil behavior. (The CASES categories and coding sheet are presented in Appendix B.) Coding comparisons, re-examination of definitions and discussion, helped to focus coding. Inter-rater reliability of .66 was obtained. (See Appendix B 2-b).

Context, presage and product data. Where necessary, instruments were piloted in non-study schools to develop administration protocols and revisions necessitated by grade level.

Familiarization Phase

During the study the investigators worked in pairs at a specific grade level, visiting each study school on alternate days. The first week allowed the teachers and pupils to relax in the presence of the investigators. During this time the investigators came to know the names of every pupil in the class from photographs and by observing classroom interaction. Data collection did not occur until the end of that week.

Collection of Classroom Process Data

Following the familiarization period, the bulk of process data were collected over the next two weeks, the exception being one grade six teacher where, due to one week's absence, the data were collected in the first and third weeks following familiarization. One investigator of the pair assigned to each grade level coded teacher-pupil dyadic interaction while the other investigator coded pupil classroom behavior. Both coders were present in the same class at the same time, visiting each school on alternate days of the two-week period.

Dyadic interaction was coded for approximately ten and a half hours per classroom. This was restricted to language arts and mathematics in grades one and three, and to language arts in grade six. Time spend in the two subject areas reflected the ratio of times allotted language-arts and mathematics, approximately three and one-half to one. Occasional reliability checks were obtained and are reported in Appendix A 3-b.

Pupil classroom behavior was obtained by observing six students at a time in rotation and continuously coding their behavior until approximately forty tallies per child were obtained. Particularly at lower grade levels, the setting (teacher directed or non-teacher directed) or subject matter would change rapidly and fewer than forty tallies would be obtained for many observation times. Each data sheet contained the date, time, school and grade, academic subject, setting, and length of time in which coding occurred. Periodic reliability checks were made at each grade level, resulting in an average inter-rater reliability coefficient of .77. In addition, five more trials were conducted with the training tape, resulting in an average coefficient of .90.

Collection of Content, Presage and Product Data

In the month following the acquisition of the classroom process data a number of attitude surveys and other self reports, ability tests, and achievement tests were administered to the pupils. Where a modification had occurred to an instrument, or where the details of an instrument's development were sketchy, retests were administered to randomly assigned groups within each class. Additional pupil information was acquired from school record cards and pupil report cards.

Provision of substitute teachers provided time for the teachers involved in this study to complete self-report inventories, questionnaires, etc. Throughout the study teachers and students were kept uninformed as to the specific nature of the study. They were assured that the data gathered would not be used to evaluate them and that their anonymity would be ensured.

Data Preparation

Pupil self-report data were tabulated by placing the value assigned to each response onto a record sheet that resembled an IBM coding sheet. Sub-test totals and overall totals were placed on the same record sheet. Prior to keypunching directly from this record sheet, a second marker completely rechecked the marking and recording of each test item, the subtotals and totals.

Other pupil data such as home background, age, sex, sociometric status and other contextual data were recorded onto IBM coding sheets for keypunching. Each instrument or aggregation of similar data that required no computer preprocessing was recorded on separate IBM cards. The first eight columns of each data card were reserved for pupil and instrument identification as shown in Table 1.

Data that required computer preprocessing was limited to classroom interaction and classroom behavior data. The Brophy-Evertson dyadic interaction data were initially re-

Table 1

Pupil Identification System Used to Permit Access to Data on Data Cards

Column(s)	Information	Example
1	school	1 or 2
2	grade	1, 3, or 6
3 and 4	pupil I.D.	01 - 31
5 and 6	data card type	"05" - attitude to school
7 and 8	data card number	"01" - first card of attitude instrument

moved from the classroom coding sheets in the form of two hundred and sixty sequences and any sequence which occurred for any pupil was keypunched. A computer program was then developed to combine these sequences into variables that have been examined in other studies which used the Brophy-Evertson instrument. This resulted in one hundred and ninety-seven frequency variables being available for possible examination. (see Appendix A-5). The CASES styles and overall coefficients for each separate subject were calculated by a computer program based on steps outlined by Spaulding (1975) and presented in Appendix B-4. Once these two sets of data were preprocessed, the transformed data were stored on disc in the form of card images.

To produce the disc space containing all the data for each pupil, the transformed data available in card images were merged with the data available on IBM cards. The data were arranged with the cards of pupil number one followed by the data cards for pupil number two etc. For the group project, one hundred and four data cards per pupil were prepared and stored. This study drew data from a file of reduced size containing fifty-four data cards per pupil.

Statistical Treatment

Analyses in this study involved two major techniques to deal with the large number of variables that were examined. The relationship between pupil characteristics and teacher-pupil dyadic interaction reported in chapter four was based mainly on canonical correlation. The examination of the pupil self-report instruments reported in chapter five employed factor analysis.

SUMMARY

This chapter began with the recommendations from the literature of the Study of Teaching that were incorporated into the design of this study, along with alterations that were made to the design of the sample when it was established.

The instrumentation section outlines the nature of each instrument employed, any modifications that were carried out to the author's original instrument, and reliability and validity data where available. Due to the number of pupil self-report measures, achievement measures, etc., employed in this study, the instrumentation section ended with a number of such instruments presented in chart form.

Procedures employed in this study were discussed as they related to the preparatory phase, the familiarization phase and the data collection phases. The data preparation phase describes the procedures used following the completion of data collection and prior to computer analysis. The final section of this chapter outlined the statistical procedures employed in this study.

CHAPTER 4

PRIMARY ANALYSIS AND RESULTS

Chapter four presents the findings related to research questions one to four, questions regarding the relationship of certain pupil characteristics with the dyadic interaction pupils have with their teacher. The purpose of reviewing the relationships among this large number of variables was to obtain an overview of their relative importance in predicting interaction and perhaps identifying those pupil variables that hold promise for further study in depth.

OVERVIEW OF THE ANALYSIS

In order to deal adequately with the number of variables involved, the basic statistical tool used to answer the questions examined in this chapter was canonical correlation. All of the variables involved in this chapter's analysis are presented in Table 2, which is divided into two sections: set A, pupil characteristics; and set B, teacher-pupil interaction variables.

The pupil characteristics listed in set A were those outlined in the review of the literature as pupil variables requiring study in relation to classroom interaction. Their

Table 2

Variables Investigated in this Chapter

Set A Pupil Characteristics		Set B Teacher-Pupil Dyadic Interaction
(i) Formative	Total number of:	
Age	#18	Pupil opportunities to respond (ARO's)
Sex	#27	Student initiated public work contacts
SES	#28	Teacher initiated work contacts (private)
Sibling position	#29	Teacher initiated personal contacts (private)
Family integrity	#30	Teacher initiated procedural contacts (private)
(ii) Properties	#35	Teacher initiated behavioral contacts (private)
Sociometric status		
Ability	#39	Student initiated private work contacts
Self-esteem	#43	Student initiated private personal contacts
Attitude to school	#191	Work contacts involving academic praise
Prior achievement	#192	Work contacts involving academic criticism
	#193	Contacts involving behavioral praise
(iii) Coping behavior while:	#194	Contacts involving behavioral criticism
Teacher directed		
Non-teacher directed		

division into formative experiences and pupil properties follows the outline employed by Dunkin and Biddle (1974). The variables in set B were chosen with a number of criteria in mind. These variables represent some of the major categories of the modified Brophy-Good Dyadic instrument and as such are descriptive of the main types of teacher-pupil interaction. These variables occurred often enough to permit meaningful comparisons and have been examined by Brophy and Good (1974) and others using this same classroom observation instrument. Finally, none of the interaction variables can be obtained by combining others in the same group, a condition imposed by canonical correlation which cannot handle linear dependency.

Research question number one investigated the relationship between the pupil formative experiences listed in set A, with the twelve interaction variables in set B (Table 2). Research question number two investigated the relationship between the pupil properties in set A and the interaction variables in set B. Thus canonical correlation involves an examination of the relationship between two sets of variables: one, a set of multiple predictors, e.g., pupil characteristics; and the second, a set of multiple criteria, e.g., teacher-pupil interaction variables. According to Harman (1967), the best linear function of the variables in each set is obtained by factorial methods and then the correlation between these composites is known as the canonical correlation.

In summary, canonical correlation is used to study the system of correlation underlying two sets of variables. As a multivariate technique it is useful in studying the relationships among a large number of variables that by nature sub-divide into two sets.

RESEARCH QUESTION NUMBER 1

To what extent are such pupil formative experiences as age, sex, socioeconomic status, sibling position, and family integrity predictors of teacher-pupil classroom interaction?

Analysis

The five formative experiences examined in this question constituted the A set of variables in a canonical correlation with a set of the dyadic interaction variables (see Table 2). This canonical correlation was repeated six times, once with each of the six classes in the study. The best predictors in each set were identified and are reported in Table 3. The final analysis in this section examined the correlations between the best predictors in Set A and all the Set B variables.

Findings

As is reported in Table 3, the five formative experi-

Table 3

Weights[1] Assigned Predictor Variables and Criterion Variables in the Canonical Correlation of Pupil Formative Experiences and Teacher-Pupil Interaction

	CLASS					
Set A Variables	1-1[A]	2-1	1-3	2-3	1-6	2-6
Age	-0.19	0.01	0.45*	-0.40	0.77*	0.22
Sex	-0.98*	0.71*	0.61*	-0.51*	0.39*	0.59*
SES	-0.09	0.50	0.50**	0.20	0.16	-0.33
Sibling pos.	0.04	0.68*	-0.37	0.18	-0.49*	0.71*
Family Int.	0.19	0.19	-0.20	0.72*	-	0.14
Set B Variables						
# 18	0.22	-0.66*	0.13	-0.02	-0.55*	-0.65*
# 27	0.30	-0.22**	-0.09	-0.30	0.53*	-0.09
# 28	-0.10**	0.08**	-0.28**	-0.17	-0.17	-0.22
# 29	0.12	0.32**	-0.38**	-	0.12	-0.03
# 30	0.16**	0.06	0.17	0.38*	-0.12	0.46*
# 35	0.41*	0.19	-0.13**	0.70*	-0.40*	0.07
# 39	-0.15**	-0.20	0.36**	-0.21	-0.12	-0.04
# 43	-0.49*	-0.26**	-0.68*	0.02	0.24**	-0.04
#191	0.33	-0.05**	-0.14	-0.17	0.34	0.55*
#192	0.40*	-0.50*	0.14	-0.42*	-0.12	-
#193	0.32	-0.09	-0.25	-	-	-
#194	0.14	0.01	-0.11	-0.01**	-	-
Canonical correlation between composite	.896	.965	.834	.892	.941	.909
Variance accounted for	.803	.931	.696	.796	.885	.826
Bartlett Probability	.042	N.S.	N.S.	N.S.	.030	N.S.
N	27	21	31	28	25	25
N. Variables	17	17	17	15	15	14

A. School and grade code (School 1 or 2, grade 1, 3, or 6)

* Indicates a high weight, a good predictor of the variable set for that class

** Indicates a low weight assigned but due to a high correlation with the composite, also a good predictor

[1] Normalized eigenvector weights (max = 1.0)

ences selected for inclusion in this study accounted for approximately 82% of the common variance in the teacher-pupil interaction variables. This ranged from a low of 70% in class 1-3 to a high of 93% in class 2-1. Using Bartlett's procedure for testing the significance of canonical correlation, only in classes 1-1 and 1-6 were the probabilities less than .05, which indicated that in those rooms the two sets of variables were related in one significant way.

Examination of the set A variables in Table 3 showed that pupil sex was the best predictor of the set A composite as it was assigned a high weight in all six classes. To a lesser extent pupil age and sibling position were shown to be predictors as well. Socioeconomic status and family integrity were not predictors in this study.

The weights assigned the set B variables in Table 3 indicate that different teacher-pupil interaction variables are best predictors for different classes, although the number of behavioral contacts (#35) and the number of personal contacts (#43) seem representative. The number of teacher-initiated work contacts (#28) and student-initiated private contacts (#34) appear to be more indicative of lower grade interaction, while a greater number of public response opportunities (#18) were apparent at the grade six level.

The zero order correlations of age, sex and sibling position with the set B interaction variables were examined (Appendix H-1) and found to range between -.5 and .45. In class 1-1, older pupils initiated more public work contacts (#27), more private work contacts (#39) more personal contacts (#43) and fewer procedural contacts with their teacher (#30). Correlation of age with the other interaction variables for this class was very low. In class 1-6 older pupils had fewer public response opportunities and received fewer contacts involving academic criticism.

The negative correlation of pupil sex with practically all measures of interaction at all grade levels indicated that boys had more interaction with their teachers than girls, particularly in public response opportunities (#18), teacher-initiated private work (#28), procedural contacts (#30) and behavioral contacts (#35). The correlation of sibling position with frequency of interaction was not as clear as was pupil sex. However, when related to public response opportunities (#18), student-initiated public work contacts (#27), private work contacts (#39), and personal contacts (#43), it would seem that older children of a family or only children had a higher proportion of interaction with the teacher than younger children of a family or middle children.

Discussion

The finding that 80% of the variance in teacher-pupil interaction could be predicted from knowledge of pupil formative experiences in this study, must be tempered by realization that multiple predictors always account for more common variance than single predictors. As well, the five formative experiences included in this analysis must be considered as a set of variables, that is, the weighting one variable received was in the context of the five variables being part of the set. In this context, pupil sex was the best predictor of set A variables, age and sibling position showed some promise, while socioeconomic status and family integrity were of little value as predictors. This latter finding could be due in part to the relative uniformity of the residential area surrounding the schools involved.

The finding that different teacher-pupil interaction variables and different pupil characteristics were best predictors in different classes would seem to indicate the unique nature of each class, both in pupils and teacher. Some of this variation may also be due in part to fluctuation due to sample size.

The correlations obtained between the best predictors of set A and the interaction variables of set B (see Appendix H-1) are a rich source of detailed classroom interaction information as well as a source of hypotheses for future studies. For example, at the grade one level, the increased number of work contacts and personal contacts for older pupils could be an indication of pupils who are experiencing difficulty receiving assistance from the teacher. At the grade six level older pupils initiated less interaction and had fewer public response opportunities than younger pupils. These findings could be an indication of a conscious effort on the part of both teacher and pupil to avoid potentially embarrassing academic situations for the older pupil. This could also reflect the increased importance of the peer rather than the adult in the life of the adolescent. A study of interaction differences based on age of the pupils within a class is a possibility, particularly when a large age range is encountered such as the twenty month range at each grade level in this study.

A second possible study indicated by this analysis could involve sibling position. The relationship of older children in a family and only children to more frequent dyadic interaction may signal greater dependence on adults. Younger children and middle children, growing up in a setting which includes other children, may be less adult dependent.

The above studies are good possibilities; however, as a result of this analysis, an intensive study of pupil sex in relation to classroom interaction would seem the most promising. The overall salience of boys in this study's classrooms is similar to the findings reported by Brophy and Good (1974), and Silberman (1969) although there were differences between classes as well as between grades. Analysis of variance based on pupil characteristic subgroupings seems to be one avenue to follow.

RESEARCH QUESTION NUMBER 2

To what extent are such pupil properties as ability, prior knowledge, self-esteem, attitude to school, and sociometric status predictors of teacher-pupil interaction?

Analysis

The five pupil properties examined in this research question constituted the A set of variables in a canonical correlation with the set of teacher-pupil interaction variables (see Table 2, previous section). This canonical correlation was repeated six times, once with each of the six classes. Any pupil who did not have a measure on any one of the pupil properties was not included in the calculations of the first four research questions. The best predictors in each set for each class were identified and are reported in Table 4. A single asterisk marks the variables assigned high weights in the canonical correlation (best predictors). Other items marked with a double asterisk received low weights, but were identified as good predictors by the variable's correlation with the composite.

Table 4

Weights[1] Assigned Predictor Variables and Criterion Variables in the Canonical Correlation of Pupil Properties and Teacher-Pupil Interaction

	CLASS					
Set A Variables	1-1[A]	2-1	1-3	2-3	1-6	2-6
SMS	0.08**	0.34**	0.85*	0.21**	-0.34	-0.314
IQ	0.07	0.24	0.15	0.04**	-0.79*	0.43*
Self-Esteem	0.48*	-0.85*	-0.38	-0.15**	-0.03	-0.16
Attitude[2]	-0.87*	-0.32**	0.30	0.96*	0.26	0.83*
Prior Achiev.	0.02	-0.03	-0.13	-0.08	0.45*	0.03**
Set B Variables						
# 18	0.02	0.28**	-0.31	-0.09	-0.40*	-0.07
# 27	-0.05**	-0.27	-0.08	0.23**	0.19**	0.52*
# 28	-0.23	0.21	-0.04	0.45*	-0.01	-0.28**
# 29	0.54*	0.40*	0.09	-	-0.28	0.05
# 30	0.24**	-0.24	-0.02	-0.38**	-0.25**	-0.43*
# 35	0.39**	0.53*	0.56*	-0.05**	-0.74*	-0.04
# 39	0.30**	-0.10**	0.22	-0.55*	0.17	-0.31
# 43	-0.15**	-0.34	-0.41*	0.13	0.10	-0.46*
#191	0.44*	0.02	0.15	0.19	0.29	-0.39
#192	0.25**	-0.08	0.24	-0.09**	-	-
#193	-0.01	0.15	0.53*	-	-	-
#194	-0.27	0.39**	-0.34	-0.48*	-	-
Canonical correlation between composite	.941	.981	.935	.929	.994	.947
Variance accounted for	.885	.962	.874	.863	.988	.897
Bartlett Probability	N.S. (.095)	0.007	0.008	0.018	0.015	0.006
N	23	21	25	26	16	23
N. Variables	17	17	17	15	14	14

A School and grade code (School 1 or 2, grade 1, 3 or 6)

* High weight indicates a good predictor of the composite

** Low weight assigned masks high correlation with the composite

[1] Normalized eigenvector weights - max = 1

[2] Measured at Grade 1 by the Oral School Attitude Test and at Grade 3 & 6 by the Barker Lunn Primary Children's Attitude Inventory

The final analysis in this section examined the correlations of the individual pupil properties with the dyadic interaction variables.

Findings

As is shown in Table 4, the five pupil properties selected for examination in this study accounted for approximately 91% of the variance in the teacher-pupil interaction variables. This ranged from a low of 86% in class 2-3 to a high of 99% in class 1-6. Using Bartlett's test of significance, a significant relationship ($< .05$) was found in the canonical correlation of all classes with the exception of class 1-1.

The set A variables shown in Table 4 did not yield one best predictor across all grades; rather some grade trends were evident. Sociometric status and self-esteem are good predictors in the composite of grades one and three, while ability and prior achievement are best predictors at the grade six level. Attitude to school is a predictor at all levels, but with two very different instruments measuring this variable, generalizations would be quite tenuous.

The weights assigned the set B variables in Table 4 confirm the findings reported in the previous section, that is, that different teacher-pupil interaction variables are the best predictors in different classes. With the exception of the number of student-initiated public work contacts (#27), the number of procedural (#30) and behavioral contacts (#35), most interaction variables are the best predictors only in one or two rooms.

Academic and behavioral praise and criticism (191-194) did not occur often, but where they did were confined to grades one and three. Teacher-initiated personal contacts (#29), student-initiated work (#39), and personal contacts (#43), appear to be more indicative of the early grades, while teacher-initiated work (#28) and procedural (#30) contacts occur more often in the upper elementary grades.

Discussion

As a set, the pupil properties used in the examination of teacher-pupil interaction accounted for a large proportion of the variance. That is, 91% of the variance in the teacher-pupil dyadic interaction variables could be predicted from knowledge of the five pupil properties. As all but one canonical correlation was significant, some confidence may be placed in the best predictors identified in each variable set.

The findings reported in this section provide an interesting contrast between lower and upper elementary grades. Social interaction, the value of self, development of classroom behavior, along with teacher and student-initiated personal contacts were associated with grade-one and grade 3 classes (particularly 1-3). The identification of ability and prior achievement as best indicators of grade six interaction, along with a decrease in personal contacts, leaves the impression of a more academic, less personal atmosphere, with greater emphasis on procedure. To some extent this same conclusion seems appropriate for class 2-3.

ZERO ORDER CORRELATIONS

In the process of accounting for the variance in teacher-pupil interaction with pupil properties as predictors, the correlations between each pupil property and all twelve dyadic interaction variables were obtained. Since few of these relationships have been reported to date in the literature, and in an attempt to place the findings of the canonical correlation in perspective, an examination of these correlations was undertaken.

As many of the correlations are low, and trends are not completely consistent across every variable or from room to room, the following sections are generalizations only. The matrices for the correlation of all pupil properties examined in relation to dyadic interaction are reported in Appendix H-2.

Findings

There was a slight tendency for sociometric status and teacher-pupil interaction to be inversely related, particularly in classes 2-1 and 2-3. That is, pupils of low sociometric status were contacted more frequently by the teacher and had their approaches accepted by the teacher more often than pupils of high sociometric status. Although this was the trend across most interaction variables, pupils of high sociometric status received more personal contacts from the teacher (#29) and more praise (#191 & #193).

Medinnus (1962) reported that teacher praise and high sociometric status were directly related. This was true in four of the six rooms of this study. In class 2-6, the direction of the correlations was almost completely opposite to the findings in the other five classes.

Discussion

This inverse relationship in some classes could be due to the teacher purposely involving low sociometric pupils to draw them into the group. However, in grades 1 and 3 sociometric status and ability were correlated positively (.38, .51, -0.01, .46). Low status pupils would tend therefore to be low ability pupils who require more assistance and therefore interact more with the teacher for academic reasons.

There seems to be justification to further examine this variable in relation to dyadic interaction; however, both self-esteem and attitude to school should also be included at the same time. This conclusion is based on the fact that sociometric status seemed to be hidden by the variables self-esteem and attitude to school and therefore had to be identified as a best predictor by its high correlation with the composite. The seemingly opposite finding in class 2-6 was followed up by an examination of Table 5. Pupils in this class had the lowest mean ability of all classes, and were considerably lower on most measures taken than class 1-6. With a greater proportion of the class composed of less able students, pupils of high sociometric status in this room were most likely pupils who held the lower status positions in other classes. This reverse norm would then find these students receiving the same type of more frequent interaction as did their counterparts in other classes.

Findings

In classes 1-1, 2-1, and 1-6, pupils of higher ability received more interaction; in class 1-3 interaction seemed evenly divided; while in classes 2-3 and 2-6, lower ability pupils in general, had more frequent interaction. In examining each interaction variable across all six classes no definite pattern seemed to exist with the exception that higher-ability pupils initiated more public work contacts (#27) while lower-ability pupils initiated more private work contacts (#39), received more academic praise (#191), as well as more procedural contacts (#30). These findings

Table 5

Mean Class Values of Selected Pupil Characteristics

Pupil Property	CLASS					
	1-1	2-1	1-3	2-3	1-6	2-6
Ability[1]	109.9	115.3	112.0	113.8	118.1	105.2
Self Esteem	66.2	75.4	62.4	67.6	62.0	70.8
Attitude[2]	90.4	99.4	59.5	49.5	54.4	47.3
Prior Achievement[3]	63.9	68.1	62.5	63.6	94.2	77.7
S.E.S	51.6	41.4	52.3	47.2	49.5	47.7

[1] At grade 1 - The Peabody Picture Vocabulary Test
At grades 3 & 6 - Lorge-Thorndike

[2] At grade 1 - Oral School Attitude Test
At grades 3 & 6 - Barker-Lunn Primary Children's Attitude Scale

[3] At grade 1 - Metropolitan Readiness Test
At grades 3 & 6 - Levels of the Metropolitan Achievement Test

are similar to the findings of Brophy and Evertson (1976b). Ability was a best predictor only in class 2-3 and the two grade six classes.

Discussion

These findings seem to follow logically as brighter pupils would be more willing to risk public work contacts. Slower pupils would feel more comfortable in private work contacts, require more procedural assistance to complete tasks, and be more likely to have academic success praised as success for this pupil is more of an accomplishment. It would also appear that teacher 2-3 was in some ways more like the grade six teachers than the other grade three teacher or grade one teachers. The lack of personal contacts as well as "ability" being a best predictor in this class tends to indicate a more formal academic atmosphere.

Findings

In classes 1-1 and 1-3, pupils of low self-esteem were involved in approximately the same numbers of interactions as high self-esteem pupils, while in classes 2-1, 2-3, 1-6, and 2-6 interaction frequency favoured pupils of low self-esteem.

Discussion.

This tendency of lower self-esteem pupils to be in more frequent interaction may be due to an as yet unexplained curiousity in the literature of self-esteem. It appears that pupils who are highly motivated to do well in school actually score lower on some self-reports involving this variable. One explanation is that highly motivated students take academic failure as a personal rebuke whereas less highly motivated individuals take their school experience less personally and thus their self-esteem scores are higher. It is possible then that this same phenomenon was seen in this study.

Findings

In grade one, frequency of interaction favoured pupils of poorer attitude to school. The same situation existed in classes 2-3 and 1-6 while in 1-3 and 2-6 the frequency of interaction was approximately the same.

Discussion

One possible explanation for this finding could be that the teacher, realizing this attitude is present, attempts to compensate for it. Another reason is that a poor attitude to school could result from an inability to do the work. The teacher would spend considerable time with pupils who have such difficulties and thus a relationship is obtained between frequency of interaction and attitude to school.

Findings

Prior achievement, as an indicator of teacher-pupil interaction, was a best predictor for the set of pupil properties only at the grade six level, especially in class 1-6 where a positive relationship existed. In other classes interaction in relation to this variable was balanced or favoured pupils of lower prior achievement.

Discussion

Class 1-6 had the highest mean ability of any class in the study. As such, the ability of the pupils, and perhaps teacher emphasis on quality could combine to make this variable as salient as it was for this room. Even in class 2-6, most correlations between prior achievement and interactions were positive, although not to the same extent as in class 1-6. In both grade one and grade three classes, the bulk of the correlations between these two variables were negative; that is, pupils of lower prior achievement received more interaction.

It would seem teachers at the grade one and three levels had more interactions based on compensating for weaknesses, while at the grade six level the emphasis seems to have changed to capitalizing on strengths. This was taken as another sign of what was referred to earlier as the more formal academic stance of teachers at the upper elementary level.

RESEARCH QUESTION NUMBER 3

What proportion of variance in teacher-pupil dyadic interaction is accounted for by pupil formative experiences, pupil properties, and measures of pupil coping behavior?

Analysis

The five formative experiences studied in question one, the five pupil properties studied in question two, plus two measures of pupil classroom coping behavior, were entered in a canonical correlation as twelve predictor variables. The twelve selected teacher-pupil interaction variables were again used as criterion variables. All variables in this analysis were presented in Table 2 earlier in this chapter. This canonical correlation was repeated three times, once with each grade represented in the study.

Findings

As is reported in Table 6, the twelve pupil characteristics as a set accounted for approximately 75% of the variance in teacher-pupil dyadic interaction within a grade. Using Bartlett's procedure for testing the significance of canonical correlation, a significant relationship between composites was found only in grade three. At both grades one and six, the correlations were just below the required level of significance.

Within the set of twelve pupil characteristics, pupil sex was the only formative experience to be a best predictor at more than one grade level. (Weights assigned in

Table 6

Calculation of Significance of the Canonical Correlation between Twelve Pupil Characteristics and Teacher-Pupil Interaction Variables

	Gr.1	Gr.3	Gr.6
Canonical correlation between composites	.875	.818	.898
Variance accounted for	.77	.67	.81
Bartlett Probability	.07(N.S.)	.001	.085 (N.S.)
N	44	51	39
N. of variables	24	22	20

canonical correlations are presented in Appendix H-3). Family integrity, attitude to school, and age were not predictors at any grade level. Sociometric status and self-esteem were predictors at grades one and three respectively, while prior achievement was a predictor at grades three and six. Pupil classroom behavior, in both teacher-directed settings and non-teacher-directed settings, was a predictor at grade three only.

Discussion

In the two previous research questions, two smaller groups of pupil characteristics were examined in relation to dyadic interaction. Some variables were then established as best predictors within their five variable set. In order to examine the relative importance of all twelve pupil characteristics as predictors of classroom interaction one side of a canonical correlation had to contain all of these variables. With twelve characteristics as predictors and twelve interaction variables as criteria, there were too many variables involved to proceed on a class basis, necessitating analysis by grade. As a result it was possible to confirm that some best predictors such as pupil sex, sociometric status, and self-esteem were important at lower grade levels. As well, ability and prior knowledge, important at high grade levels, should be followed up in future studies. In general, each grade level was represented by different best predictors, both in pupil characteristics and teacher-pupil interaction.

This research question included the overall CASES coefficient, both in teacher-directed and non-directed settings as a measure of pupil classroom behavior. This variable was included in this analysis due to its increasing importance as a variable in process-product studies (e.g., Papageorgiou, 1973). Its role as a best predictor at the grade three level emphasized its importance in such studies.

This analysis also served to emphasize the importance of context to a set of findings. That is, a variable identified as a best predictor in the context of one set of variables may not be a predictor when examined with a different group of variables.

A difficulty in classroom research was also apparent when the results of this section's grade by grade canonical correlations were compared with previous class analyses. Findings within classes sometimes disappeared when data was combined. The dilemma involves the amount of statistical instability one can live with in order to gain insight into differences between classes. As stability increases with sample size, researchers could very well be masking the very differences they are searching for.

RESEARCH QUESTION NUMBER 4

What proportion of variance in pupil behavior is accounted for by pupil formative experiences, pupil properties and teacher-pupil interaction variables selected for this study?

Analysis

The analysis used in this segment of the study involved a multiple regression technique employing pupil formative experiences, pupil properties, and teacher-pupil interaction variables as predictors with the overall CASES coefficients (pupil behavior) as criterion variables. Thus for each of the three grades, there were two calculations: one which utilized the pupil's behavior in teacher-directed settings as the criterion; and a second in which his behavior in non-teacher directed-settings was the criterion.

Findings

As is shown in Table 7, the large group of predictors involved in this analysis accounted for approximately one third of the variance in behavior with the exception of the grade one teacher-directed setting in which only eight percent of the variance was accounted for.

Table 7

Variance in Pupil Behavior Accounted for by Predictors in Multiple Regression Analysis

Grade	Setting	Multiple R	Variance Accounted For
1	TD	.28	.078
	NTD	.61	.372
3	TD	.63	.397
	NTD	.62	.384
6	TD	.61	.372
	NTD	.53	.281

Discussion

The discovery that approximately one-third of the variance in pupil behavior was predictable from knowledge of pupil characteristics and interaction variables prompted speculation as to variables that are related to the larger proportion of variance in behavior not accounted for. As this study was carried out late in the year, long after teachers have developed the types of pupil behavior patterns that they accept, perhaps the missing variance is related in part to teacher expectations of pupil behavior. Similar measures of behavior carried out early in the year could be useful in examining this question more closely.

The finding at the grade one level, that even a smaller percentage of the variance in pupil classroom behavior may be attributed to this study's predictors, resulted in an investigation of the correlations between the predictor and criterion variables (see Table 8). The grade one teacher-directed setting is marked almost exclusively by correlations

Table 8

The Distribution of the Correlations between Predictors and Criterion Variables Employed in the Multiple Regression Analysis

	GRADE					
	1		3		6	
	Setting		Setting		Setting	
Range of Correlation Coefficients	T.D.	N.T.D.	T.D.	N.T.D.	T.D.	N.T.D.
0 - .1	11	7	5	3	7	9
.1 - .2	10	5	4	4	5	4
.2 - .3	2	4	5	8	2	2
.3 - .4		5	7	5	1	3
.4 - .5		2		1	3	1

less than .2, whereas in other grades and settings, there is a wider, more even distribution of relationships. The low correlations at the grade one level account for the low percentage of variance that is predictable. What pupil characteristics then are related to this measure of pupil classroom behavior?

One possible explanation could be the intensity with which these pupils listened to a story being read to them, or perhaps the careful manner in which they followed in their readers while others read aloud. A third reason could be that at this level, the habits teachers have inculcated in regards to classroom behavior are more closely adhered to by the pupils in their efforts to please the teacher.

Thus, in spite of the unaccounted for variance in pupil classroom behavior, such measures were found to have utility in prediction of classroom interaction, particularly at the grade three level. Such measures may be of even greater use in studies which involve a more heterogeneous student body than was evident in this study.

SUMMARY

Chapter four involved the examination of four research questions that dealt with pupil characteristics as predictors of teacher-pupil interaction. Following a brief description of canonical correlation, five formative experiences of pupils (age, sex, socioeconomic status, sibling position, and family integrity) were evaluated as predictors. Pupil sex was found to be the best predictor, and, to a much lesser extent, sibling position. As a set, pupil formative experiences accounted for eighty-two percent of the variance in the dyadic interaction variables.

Five pupil properties, sociometric status, ability, self-esteem, attitude to school and prior achievement, accounted for ninety-two percent of the variance in interaction variables. Overall, different teacher-pupil interaction variables and different pupil properties were identified as best predictors in each class. At the grade one and three level, sociometric status and self-esteem were predictors, whereas ability and prior achievement were more important at the grade six level. The zero order correlations between each pupil property and the interaction variables were examined and discussed in detail.

Another canonical correlation included all pupil characteristics examined in this study. The importance of ability as a predictor at all grades, sociometric status and self-esteem at grades one and three, and prior achievement at grade six, emerged as best predictors in an analysis which accounted for approximately seventy-five percent of the common variance in teacher-pupil interaction.

The final section in this chapter involved the prediction of variance in pupil classroom behavior measures, using pupil formative experiences, pupil properties, and dyadic interaction variables as predictors in a multiple regression analysis. Approximately one-third of the variance in classroom behavior was accounted for by this approach.

CHAPTER 5

SECONDARY ANALYSIS AND RESULTS

The purpose of the secondary analysis was to examine the dimensions underlying selected pupil self-report instruments administered in the group research project as well as to derive test-retest reliability measures where these data were collected. This chapter therefore addresses research questions five and six of this study.

RESEARCH QUESTION 5

Did the Oral School Attitude Test, Written School Attitude Test, Self-Esteem Inventory, and the My Class Inventory exhibit factors similar to the underlying dimensions described by the original author?

ORAL SCHOOL ATTITUDE TEST

Analysis

The Oral School Attitude Test (Appendix C-1) was submitted to a number of factor analyses which requested, in turn, two, three, four, five, and six factors from the twenty-nine item instrument. All solutions reported employed smc's in the diagonal, varimax rotation, and factors interpreted had roots greater than one. A final analysis used "Teacher perception of pupil attitude to school" as a tracer variable in an attempt to relate the factors obtained to an outside measure.

Findings

The most consistent finding in the factor analyses of the Oral School Attitude Test was the clustering of items 12, 24, 25, 27, and 28, which appeared as a separate factor in the three, four and five-factor solutions, a definite departure from Rivera's findings. These items all contain a negative implication related to school work not done, being scolded, etc. The four-factor solution presented in Table 9 contains three factors which approximate the three dimensions reported by Rivera as well as a fourth, the "negative implications" factor. The three and

Table 9

Test Item Loading[1] on a Four Factor Principal Axis Analysis and Varimax Rotation of the Oral School Attitude Test[2]

Factor 1	Factor 2	Factor 3	Factor 4
"Student-instruction interaction"	"Interpersonal relations"	"General school"	"Negative implications"
Items	Items	Items	Items
2*, 3*, 9*, 11*, 14*, 16*, 23*, 26*	4*, 5*, 6, 7*, 8, 10, 15, 20	1*, 17*, 18*, 19*, 21, 22, 29	12, 24, 25, 27, 28

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1 Complete loading matrix presented in appendix C-3

2 N - this study - 107

* indicates items that appeared in a dimension similar to one reported by the original author (N=200)

four-factor solutions in this study were interpretable; however, neither solution is without difficulty as a few unrelated items load on the factors as well. The factor loading matrices of these solutions appear in Appendices C-2 and C-3. A comparison of Rivera's three factors to this study's three factor solution is reported in Appendix C-4. The two-factor, five-factor, and six-factor solutions are not reported, as the items which loaded on the factors were not amenable to acceptable interpretation. The variance accounted for by these analyses ranged from 23% in the two factor solution to 42% in the six-factor solution.

The tracer variable "Teacher perception of pupil attitude to school" produced loadings near zero or slightly negative. Negative correlations were expected as tracer values ascend while total scores descend. Actual values are reported in Appendix C-2.

Discussion

As seen in Table 9 there were definite similarities between three of the factors obtained in this study and the three factors reported by Rivera. Items marked with an asterisk are those that are related to a similar factor. In this study, however, the fourth underlying dimension is a departure from Rivera's three-factor solution. The items in this fourth factor were items that Rivera indicated should have reverse polarity, i.e., the values assigned are opposite to the usual trend. In this study, however, all primary loadings were positive, and these items (12, 24, 25, 27, 28) appeared as a distinct factor along with the other three. The four-factor solution therefore is the most satisfactory solution in this set of analyses.

The similarities between Rivera's three factors and factors one to three of the four-factor solution, the similarity of his reverse polarity items to factor four of this study, and the small number of items with little contribution to the communality foster some confidence in the stability of the instrument. However, other measures of attitude to school are required to better assess the validity of the instrument. Such tracer variables as teacher and parent rating of pupil attitude, pupil interview data, etc., could help to explain why the tracer variable employed in this study was not related to the derived factors to any extent.

WRITTEN SCHOOL ATTITUDE TEST

PRIMARY INVESTIGATION

Analysis

In this study the Written School Attitude Test (Appendix D-1) was administered to fifty grade-six pupils. Following a subjective examination of the test items, the pupil responses to this instrument were submitted to a number of factor analyses employing principal axis factoring with unity in the diagonal and varimax rotation. Following each solution of from two to nine factors, the test items that correlated with each factor were examined for psychological meaningfulness.

Findings

Examination of test items. The initial examination of the Written School Attitude Test involved studying the items that were related to each factor and comparing them to the name McCallon had assigned the factor. His three factors appear to be properly labelled, although, due to the diverse nature of some items loading on a factor, the factor names tend to be very general. The forty-six test items refer to such areas as pupil attitude to school, attitude to school work, teacher-pupil interpersonal relations, the role of the teacher, relations with others in the school, and instruction. The general nature of the factors and the lack of development detail reported on the instrument introduced an element of caution into subsequent interpretation.

Solutions requesting two to nine factors. The factor analyses of the Written School Attitude Test reported in this section involved correlations between test items and factors that were more positive and more highly negative than those obtained with the Oral School Attitude Test. As well, only the three and four-factor solutions will be reported as the interpretation of other solutions was unsatisfactory due to the presence of unrelated items consistently loading on the factors.

Solutions requesting three and four factors. The three factor solution of this study which accounted for 34% of the variance, was compared to McCallon's three-factor solution and is reported in Table 10. Although there were clusters of items that loaded heavily on factors similar to McCallon's, there also were a number of items loading on each factor that made the naming of each factor quite tenuous. The factor-loading matrix for this solution (reported in Appendix D-2) indicated that a sizeable number of items contributed little to the communality. The tracer variable "Teacher perception of pupil attitude to school," as shown in Table 10, correlated quite highly with factor "Student Instruction Interaction" and provided a useful external reference point.

The four-factor solution (Appendix D-3) included a very satisfactory bi-polar interpersonal relations factor, a "General School Factor," a "Student Instruction Interaction Factor," and a "Positive Supportive Teacher" factor. Most noteworthy in this solution, however, was the continued presence of unrelated items loading on each factor.

Table 10

Comparison of McCallon's Three-Factor Solution and This Study's Three-Factor Solution[1] on the Written School Attitude Test[2]

McCallon's Factors	Factors derived in this Study		
	Factor 1	Factor 2	Factor 3
	"Student instruction interaction"	"Interpersonal relations"	"General school
Factor 1. General school	Items 17, 20, 21, 46	22, 27	1*, 23, 24, 37, 41
Factor 2. Interpersonal relations	34, 35	15, 19, 25, 26, 42, 43	45
Factor 3. Student instruction interaction	3, 4, 6*, 7*, 8, 14, 16, 18, 28, 31, 33, 38, 40	2, 5, 9, 12, 13, 30*	10, 11*, 29* 32, 36, 39, 44
Tracer Variable	-0.591	-0.262	0.269

[1] Principal axis factoring with 1's in the diagonal, varimax rotation, N=50.

[2] Full factor loading matrix appears in appendix D-2

* Contributed <.2 to the communality.

Discussion

Based on this part of the investigation, the Written School Attitude Test would appear to have three or four underlying factors. A number of the test items which were related in McCallon's analysis were related in this study as well. However, there were a number of items loading on the factors which were difficult to relate to the items that gave the factor its name. This finding, along with the discovery of items that contributed little to the communality, redundancy among test items, and the very general nature of the derived factors, all seem to indicate that this instrument requires additional development prior to its use in future studies of this type.

To examine this contention, a secondary investigation of the Written School Attitude Test was carried out involving the factor analysis of pupil responses with some test items not included (items that contributed $<.2$ to the communality). As reported in Appendix D-4, the four-factor solution imposed on the reduced instrument gave the most interpretable solution of all the analyses carried out on this instrument.

Additional development for this instrument could include administering the forty six items to a sample larger than that employed by McCallon (N=100) or this study (N=50) and factor analyzing the pupil responses. Items that contribute little to the communality could be replaced by additional items identified either by interviewing the pupils or items that are related to the underlying dimensions. A parallel activity should include development of other measures of pupil attitude to school such as parent ratings and interviews, pupil interviews, and peer ratings. Alternate measures such as these could provide valuable tracer variables to relate the derived factors to outside reference points much as the tracer employed in this study was a sign of promise for factor one of the three factor solution.

SELF-ESTEEM INVENTORY

Analysis

One hundred and fifty-six pupils from grades one, three, and six were administered the Coopersmith Self-Esteem Inventory (Appendix F-1) in this study. Initially, the responses of one hundred and eight grade three and six pupils were factor-analyzed using a principal axis factoring with unity in the diagonal and varimax rotation. Separate analyses were conducted, extracting three, four, and five factors and subsequently each factor was analyzed for psychological meaningfulness. The same analyses were conducted on the responses of the forty-eight grade one pupils who had completed a modified version of this instrument (Appendix F-2).

The final analysis of this section consisted of the rotation of a grade one solution to see how closely its four factors would match the four factors obtained from the analysis of the grade three and six instrument.

Findings

A four-factor solution to the grade three and six instrument accounting for 31% of the variance was found to be the most satisfactory solution in this study. As is shown in Table 11, the strongest factor to emerge was one composed of items in which the student is self-derogatory, for example, "I'm a failure, I can't do anything right," along with similar items referring to his home. The second factor, "Self certainty," and factor three, "Assertiveness-anxiety," were also quite distinct. Factor four, "School-academic," was identifiable but not as clearly defined as the other three factors.

The five-factor solution was useful in that it seemed to confirm the four-factor solution. The factors derived were almost identical to the four previously discussed with the addition of a factor composed of mixed items. The factor-loading matrices are reported in Appendices F-3 and F-4. The three-factor solution was not easily interpretable and is not reported.

The factor analyses of the grade one responses to the Self-Esteem Inventory were inconclusive. The four-factor

Table 11

Four Factor Solution[1] to Grade Three and Six Pupil's[2] Responses on Coopersmith's Self-Esteem Inventory

Factor 1	Factor 2	Factor 3	Factor 4
"Self-degradation, home"	"Self-certainty"	"Assertiveness - anxiety"	"School - academic"
Items: 54, 40, 51, 38, 33, 26, 58, 43, 21, 17, 50, 47, 19*	11, 4, 24, 18, 36, 45, 7, 44*	42, 31, 12, 37, 39, 16, 30, 9*, 23, 3*, 8*	14, 25, 15, 1

[1] Principal axis factoring with l's in the diagonal, varimax rotation, (factor loading matrix in Appendix F-3).

[2] N=108

* Items contributing <.2 to the communality.

solution which was most satisfactory with the grade threes and sixes was not reproduced with the grade ones. A few items clustered on each factor much as they did in the grade three and six analysis; however in general, patterns of related items did not load on the factors. The three and five-factor solutions produced similar mixed factors.

To investigate whether the unsatisfactory factor solution to the grade one responses was an artifact of the factor analysis or due to differences in pupil perception, an orthogonal procrustes to target was performed. That is, the four factors obtained from the grade one responses were rotated using the four factors of the grade three and six solution as the target to see how closely the two sets of factors matched. The first factors of each solution were shown to be very similar, but the other factors displayed little relationship. The matrices of this match are reported in Appendix F-5.

Discussion

The items forming the Self-Esteem Inventory were selected by Coopersmith from a larger pool of items identified by Rogers and Dymond (1954). A panel of five psychologists classified the items as indicative of high and low esteem and by rational means arrived at four subtest groupings. The responses of seventy-six hundred grade four to eight pupils were the subject of an intensive factor analysis of this instrument by Kokenes (1973) who identified four bi-polar factors similar to Coopersmith's subtests. Other studies have identified four or five factors as well, so the presence and nature of the four factors identified at the grade three and six level in this study seems reasonable.

The grade three and six analysis, however, did contain items that contributed little to the communality. There was some redundancy among items and a fifth subtest, a lie scale, was found to be of little value. These findings suggest that future exploratory work with this instrument should also be carried out with the twenty-five item short version. (Correlation between short and long form is .86).

The procrustes match indicated that the less satisfactory grade one solution was not an artifact of the varimax rotation. With the exception of the first factor, the comparison of factors revealed they were not closely related, suggesting that the two groups of pupils were perceiving the items differently. This result was not totally unexpected as younger pupils might interpret items differently, and the tendency of some to acquiesce is also a possibility. A similar study in the future could involve individual administration of this instrument, or the short version, along with other measures of this variable.

MY CLASS INVENTORY

Analysis

One hundred and eight grade three and six pupils were administered the My Class Inventory (Anderson, 1973) presented in Appendix G-1. The pupil responses were examined for underlying dimensions using principal axis factoring with unity in the diagonal and varimax rotation, requesting in turn four, five and six factors. The same items, presented in a slightly different form (Appendix G-2), were administered to forty-eight grade one pupils, followed by the same type of analysis. A final factor analysis examined the responses of all pupils in the study together.

Findings

A subjective examination of Anderson's factors revealed five well-named factors, each containing nine test items that for the most part clearly belonged to one dimension.

The most satisfactory solution of the seven factor analyses carried out on the My Class Inventory was the five-factor solution imposed on the grade three and six pupil responses. As is shown in Table 12, the five factors obtained in this study approximate quite closely the underlying dimensions described by Anderson, i.e., satisfaction, friction, competitiveness, difficulty, and cohesiveness.

The eight items Anderson indicated to have reverse polarity were confirmed in these analyses with the exception of items 10 and 25. Of the forty-five test items, only two contributed little to the communality. The factor loading matrix for the five-factor solution is reported in Appendix G-3. The four and six-factor solutions were similar but not as distinct, and are not reported in detail.

The three analyses carried out on the grade one pupil responses were not satisfactory as most factors contained a mixture of items. The five-factor solution which included all pupils from grades one, three, and six, confirmed this finding as the five factors obtained were identifiable but not as distinct as those obtained from the responses of the

Table 12

Comparison of Anderson's Five Factor Solution and this Study's Five Factor Solution[1] to Responses on the My Class Inventory[2]

Anderson's factors	Factors derived in this study				
	Factor 1 Satisfaction	Factor 2 Friction	Factor 3 Cohesiveness	Factor 4 Competitiveness	Factor 5 Difficulty
Factor 1 Satisfaction	1, 7, 11, 16, 21, 31, 36, 43				
Factor 2 Friction		2,6,13,17, 32, 37	26*, 22		41
Factor 3 Competitiveness	3	12, 30		8, 18, 25 42	35, 39*
Factor 4 Difficulty	14	24	20	4, 29, 10	4, 34, 40, 44
Factor 5 Cohesiveness		23	5, 15, 28, 33, 38, 45	19	9

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[1] Principal axis factoring with 1's in the diagonal, varimax rotation, N=108

[2] Factor loading matrix appears in appendix G-3

* Contributed less than .2 to the communality

grade three and six pupils alone (see Appendix G-4 for loadings).

Discussion

A number of findings in the analysis of this instrument at the grades three and six level seem suggestive of a fairly stable instrument that has undergone care in development. This study's agreement on items requiring reversed polarity, the small number of items with little contribution to the communality and the identification of factors all foster confidence in this instrument.

The analyses of the grade one responses, however, do not permit this same confidence. The mixed nature of the factors would seem to indicate that some of the pupils of this age perceived the items differently. This would seem to indicate the need to obtain measures on variables such as attitude to school by a variety of approaches, particularly when working with younger children.

RESEARCH QUESTION 6

"Did the Oral School Attitude Test, Self-Esteem Inventory and the My Class Inventory exhibit test-retest reliability similar to the values reported by the original author?"

TEST-RETEST RELIABILITY

Test-retest reliability is established by administering a test twice to a sample of individuals and correlating the two sets of scores. When a test is administered twice to the same group with a time interval separating the two administrations, some variation or fluctuation in the function measured may occur (Ferguson, 1971). The changes may be due in part to error, an actual change in the function, a memory effect, varying environmental conditions such as noise, temperature, etc. Varying psychological factors such as fatigue, etc., may also have an effect. In this study such fluctuations could also be due in part to the small number of pupils retested at any one grade level.

A table of random numbers was used to subdivide each class into groups. Each instrument under study was then re-administered to one of the groups within each class. Pearson product moment correlations were obtained between test-retest scores and are reported in the following three sections.

ORAL SCHOOL ATTITUDE TEST

The Oral School Attitude Test was re-administered to 21 of 48 initially-surveyed grade ones, and 21 of 59 grade threes. Test-retest correlations between test total scores are reported in Table 13.

Findings

Within the test-retest sample, there was little difference between the total attitude scores of each grade, al-

Table 13

Test-retest Means and Reliability Coefficients of the Oral School Attitude Test over a 16 day Interval

		MEAN		
Grade	N	Test	Retest	Reliability Coefficient
1 & 3	42	97.238	95.571	.695
1	21	96.857	95.333	.678
3	21	97.619	95.809	.725
Author	200	(over 10 days)		.77

though grade three scores were slightly higher. At both grade levels retest means were lower. The grade one reliability coefficient was calculated to be .678, the grade three coefficient was .725 while the combined grade one and three coefficient was .695.

Discussion

The increase in reliability from grade one to three was expected. The reliability coefficient reported by the original author, Rivera (1971) was .77. The approximate .70 obtained in this study is acceptable considering the smaller sample as well as the administration of this test-retest late in the school term (late May and June).

SELF-ESTEEM INVENTORY

The Self-Esteem Inventory was re-administered to 24 of 48 initially surveyed grade ones, 28 of 59 grade threes, and 23 of 52 grade sixes. Test-retest correlations between inventory total scores are reported in Table 14 along with means for each grade.

Table 14

Test-retest Means and Reliability Coefficients of the Self-Esteem Inventory over a 20 Day Interval

Grade	N	MEAN Test	 Retest	Reliability Coefficient
1, 3 & 6	75	65.120	68.666	.844
1	24	67.750	72.000	.792
3	28	64.786	67.286	.889
6	23	62.783	66.869	.848
3 & 6	51	63.882	67.098	.870
Author Gr. 5	30	(35 day interval)		.88

Findings

Within the test-retest sample, the modified version of the Coopersmith (1967) Self-Esteem Inventory used with grade one students (see Appendix F-2) had a mean very similar to the mean calculated for all grade one subjects in the study. The reliability coefficient of .792 obtained with this modified version was lower than the reliability coefficients of .889 and .848 calculated for grade three and six students on the regular version of the Self-Esteem Inventory (see Appendix F-1).

Discussion

The grade one reliability coefficient on the modified Self-Esteem Inventory was lower than both grade three and six coefficients, a continuation of the trend noted on the two other instruments described in this section. The tendency of increased reliability across all three grade levels was not seen with this instrument. The coefficients of .792, .889, and .848 compare quite favorably with Coopersmith's (1967) reported .88 with a sample of grade five students.

MY CLASS INVENTORY

The My Class Inventory was re-administered to 21 of 48 initially surveyed grade ones, 22 of 59 grade threes, and 26 of 52 grade sixes. Test-retest correlations between subtests are reported in Table 15 and correlations between test-retest overall totals are reported in Table 16.

The grade one data were obtained by administering Anderson's (1973) original inventory in a form more suited to pupils of that age (see Appendix G-2). Grades three and six are reported in a combined form as this age range

Table 15

Test-retest Reliability Coefficients of the My Class Inventory Sub-tests over a 21 Day Interval

		My Class Inventory Subtests				
Grade	N	1	2	3	4	5
1, 3 & 6	69	.629	.611	.587	.696	.525
1	21	.340	.600	.638	.525	.468
3	22	.728	.514	.510	.756	.253
6	26	.648	.740	.495	.776	.712
3 & 6	48	.688	.628	.566	.754	.502
Author Grs 3-6	655	.77	.70	.56	.56	.54

Table 16

Test-retest Means and Reliability Coefficients of the My Class Inventory Total Score over a 21 Day Interval

		MEANS		
Grade	Mean	Test	Retest	Reliability Coefficient
1, 3, & 6	68	97.235	95.426	.690
1	21	100.809	98.667	.592
3	22	98.727	97.591	.627
6	25	92.920	90.800	.691
3 & 6	47	95.638	93.979	.707

corresponds to the age of the pupils in Anderson's original sample. The instrument administered to these grades is presented in Appendix G-1.

Findings

As shown in Table 15, the combined grade one, three, and six coefficients and the combined grade three and six coefficients of this study fall within a range similar to the author's reported reliabilities even though specific subtests fluctuate. With the exception of one subtest, the grade one coefficient is always lower than one of the grade three and six coefficients.

Table 16 presents the My Class Inventory test-retest reliability coefficients that were based on total scores. These coefficients reflect the same increase by grade level as they rise from .592 to .691.

Discussion

The increasing reliability by grade level of self-report data is predicted in the literature; however, the trend in this study is gradual and is no more severe than the range of subtest reliability coefficients within a grade level. In general, however, the range obtained in this study with the My Class Inventory (.70 - .53) is similar to the range (.77 - .54) reported by Anderson.

SUMMARY

Chapter five presented the report of the secondary analysis of this study, i.e. research question number five involving the factor analysis of pupil responses to selected instruments administered in this study while research question number six required the establishment of test-retest reliability measures.

A four-factor solution was most suitable for the Oral School Attitude Test, even though Rivera reported three factors. The instrument appeared somewhat stable, although other measures of attitude to school are required to assure its validity.

A four-factor solution on a reduced number of items produced the most satisfactory solution for the Written School Attitude Test. It would appear this instrument requires additional development both for internal consistency and measures of external validity.

The Self-Esteem Inventory, when factor analyzed, produced factors similar to those reported in other studies. In future studies, other measures of self-esteem should be used along with this instrument, particularly with younger children.

The factor analysis of the My Class Inventory produced a five-factor solution that was very close to the author's reported five factors. This solution more closely approximated the author's solution than did those of any of the other instruments reviewed in this section.

The test-retest reliability data generated in this study were quite close to those reported by the authors, particularly when the small number of test-retest subjects used in this study is taken into account.

CHAPTER 6

The initial section of this chapter summarizes the study and includes a re-statement of the problem and sub-problems, followed by a description of the instrumentation, methodology and findings. The chapter closes with conclusions and recommendations for further research

SUMMARY OF THE STUDY

Problem

What is the relationship between pupil characteristics and teacher-pupil dyadic interaction?

Sub-problems

(1) To what extent are such pupil formative experiences as sex, age, SES, sibling position and family integrity predictors of teacher-pupil dyadic interaction?

(2) To what extent are such pupil properties as ability, sociometric status, self-esteem, attitude toward school and prior knowledge, predictors of teacher-pupil dyadic interaction?

(3) What proportion of variance in teacher-pupil dyadic interaction is accounted for by pupil formative experiences, pupil properties and by pupil classroom behavior?

(4) What proportion of variance in pupil classroom behavior is accounted for by pupil formative experiences, pupil properties and by teacher-pupil dyadic interaction?

(5) Did the Oral School Attitude Test, Written School Attitude Test, Self-Esteem Inventory, and the My Class Inventory, exhibit factors similar to the underlying dimensions described by the original author?

(6) Did the Oral School Attitude Test, Self-Esteem Inventory, and the My Class Inventory, exhibit test-retest reliability similar to values reported by the original author?

INSTRUMENTATION AND METHODOLOGY

The cornerstone of this study was Dunkin and Biddle's (1974) recommendation to pair context data, for example pupil characteristics, with process data, such as teacher-pupil dyadic interaction. Such studies could provide insight into the growing belief that differences in pupil characteristics evoke differential teacher reaction.

This study was part of a group approach to the study of teaching carried out in Western Canada by six researchers in the spring of 1976. The sample for the project consisted of one grade one class, one grade three, and one grade six, in each of two participating schools, a total of one hundred and fifty-seven pupils and their six teachers.

Following a preparatory phase in non-study classrooms, a familiarization week was scheduled in the classes involved in the study. During the data collection phase, one observer per class recorded teacher-pupil dyadic interaction using the modified Brophy-Good (1973) observation instrument while a second observer recorded pupil behavior in terms of Spaulding's (1975) C.A.S.E.S. instrument. As the pupils were known by name to the pair of observers, both dyadic interaction and classroom behavior were recorded for each pupil in the study: one pair of observers remained with one grade level for the two weeks of classroom observation.

During the month following classroom observation, the six researchers remained in the schools collecting information from school files and teacher records. During this time pupils were administered a number of self-report instruments, ability and achievement tests. Substitute teachers were hired to provide time for teachers involved in the study to complete questionnaires and other self-report instruments. Throughout this study, existing instruments were used wherever possible.

Following the study, context and product data were keypunched and stored on IBM cards. Classroom observation data was preprocessed by computer and merged with the data available on cards. The resultant file of data was stored on disc for subsequent analysis.

SUMMARY OF FINDINGS

The first four research questions to be dealt with in this study concerned the relationship of pupil characteristics to the frequency of teacher-pupil dyadic interaction.

For each class in the study, five pupil formative experiences (age, sex, socioeconomic standing, sibling position and family integrity) were entered as a variable set in a canonical correlation with twelve interaction variables. In two classes the canonical correlation was significant, and the formative experiences utilized as predictors accounted for approximately eighty percent of common variance in interaction. Pupil sex was identified as the best predictor, followed to a lesser extent by sibling position and age. The correlations between these three predictors and the dyadic interaction variables were then examined. Older pupils within a grade tended to have more private work contacts with the teacher as well as more personal contacts. Older children in a family and only children in a family had more interaction while boys, on practically all variables at all grade levels, had more interaction than girls.

Five pupil properties (ability, prior knowledge, self-esteem, attitude to school, and sociometric status) when examined as a set of predictors in a canonical correlation with the interaction variables accounted for ninety-two percent of the variance among the criterion variables. In five of the six classes in which this analysis was conducted, the canonical correlations between the two sets of variables were significant. In the main, different variables were best predictors at different grade levels; for example, sociometric status and self-esteem were best predictors at grades one and three, while ability and prior achievement were dominant at grade six. Attitude to school was a predictor in at least one class per grade level. The correlations of each pupil property with the interaction variables were examined for meaningful relationships. At the grade one and three levels, sociometric status, self-esteem, and attitude to school, were in general inversely related to frequency of interaction. Pupils of higher ability had more public interaction while lower ability pupils had more private interaction. Prior achievement was negatively related to interaction at the grade one and three levels and directly related at the grade six level.

This examination of pupil properties in relation to the frequency of interaction left the impression that interaction at lower grade levels seemed to be based on compensating for weaknesses in a personal atmosphere while at the upper elementary level the approach was more impersonal and related to developing pupil strengths.

The five pupil formative experiences, five pupil properties and two measures of pupil classroom behavior were combined as one set of predictor variables in a canonical correlation with the twelve interaction variables as the criterion set. This analysis, conducted on a grade basis, accounted for approximately seventy-five percent of the interaction variance. Again, different variables were best predictors at different grade levels; however, pupil sex, sociometric status, and self-esteem, along with prior achievement, were identified as predictors. Pupil behavior was identified as a best predictor at grade three only. All of the variables used in this analysis were also used as predictors in a multiple regression analysis with the two pupil behavior measures (overall CASES coefficients) as criterion variables. This process accounted for approximately one-third of the variance in pupil behavior when examined on a grade basis.

Research questions five and six examined a number of the pupil self-report instruments used in this study and in the larger project.

The twenty-nine item Oral School Attitude Test was factor analyzed, and, in this study, a fourth dimension was present along with the three described by the author. Test-retest reliability was found to be .70 in comparison with Rivera's reported .77.

The forty-six item Written School Attitude Test (Mc-Callon) was factor analyzed a number of times, some items were removed, and it was re-analyzed. A four-factor solution on a reduced number of items was the most satisfactory solution; however, there were a number of indicators that this instrument requires additional development prior to use in the future.

The Self-Esteem Inventory (Coopersmith) was factor analyzed and a four-factor solution similar to the author's four dimensions was obtained. Test-retest reliability was found to be .84, which compared quite favourably to the author's reported .88.

The My Class Inventory (Anderson) was factor analyzed and exhibited five factors that were extremely close to the author's factors. However, factor analysis of the grade one pupil responses on this instrument and the Self-Esteem Inventory produced factors that were very mixed in nature. Test-retest reliability on the sub-scale scores of the My Class Inventory ranged from .50 - .75 while Anderson reported .54 - .77.

CONCLUSIONS

Research questions one, two, and three, accounted for a high proportion of variance in teacher-pupil interaction variables through the use of pupil characteristics as predictors. That is, from 75% to over 90% of the variance in teacher-pupil dyadic interaction was predictable from knowledge of pupil properties. This high relationship between characteristics and interaction therefore would seem to support the belief that pupil characteristics evoke differential teacher response.

As a set, the pupil properties of sociometric status, ability, self-esteem, attitude to school, and prior achievement were better predictors of interaction variance than the pupil formative experiences of age, socioeconomic status, sibling position and family integrity.

Pupil sex seemed to be the best predictor across grade levels; sociometric status and self-esteem were useful at lower elementary grade levels; while ability and prior achievement were more prominent at upper elementary levels. In general different variables were best predictors at different grade levels offering some evidence of the unique nature of each class. Even though socioeconomic status and family integrity were not predictors in this study, other studies carried out in areas of more variant social conditions may find these variables much more useful as predictors.

There was some evidence to indicate the existence of a more personal compensatory form of education at lower grade levels with a more formal academic setting at the upper elementary levels.

The necessity to combine class data into grade data for two of the analyses in this study demonstrated the possibility of differences between classes cancelling each other, thereby concealing individual findings.

The factor analyses carried out on the pupil self-report instruments led to a number of conclusions. The Oral School Attitude Test was found to be reasonably stable, although administration of the test to a large sample would allow more confidence in the sub-scale scores. The Written School Attitude Test would seem to require additional development prior to use in future studies of this type. The Self-Esteem Inventory was quite stable although future consideration could be given to the use of the short version of this instrument. The My Class Inventory was the most stable instrument analyzed in terms of the correspondence of factors obtained in this study to the author's factors. The sub-scale scores of the Self-Esteem Inventory and My Class Inventory should be treated with caution at the grade one level, as the factors obtained were more mixed in nature than those at the grades three and six levels.

Canonical correlation and the accompanying zero order correlations proved to be a useful procedure to examine the relationship between two sets of variables. The factor analysis procedures provided a means to examine the dimensions underlying certain self-report instruments. These techniques were useful in this study, however, the researcher must remember such tools are a means to an end, not an end in themselves.

RECOMMENDATIONS FOR FURTHER RESEARCH

(1) The finding that pupil sex was a predictor of dyadic interaction should be followed up by a study to examine the physical, social and emotional antecedents that are related to the prominence of this variable in predicting classroom interaction.

(2) A more intensive study of sibling position should be considered. If initial analysis employed fine distinctions between sibling positions, and later analyses in the same study used more gross categorization, perhaps a statement could be made describing the level of complexity required when dealing with this variable in relation to classroom interaction.

(3) To date, the literature of classroom interaction studies has examined differences in interaction across grade levels. A study examining differences in interaction based on age range within a class could be an area of future exploratory research.

(4) A study examining the relationship of teacher-pupil interaction with sociometric status, self-esteem, and attitude to school would seem to be a definite possibility. Measures of self-esteem could be obtained by considering the use of the short version of the Self-Esteem Inventory as well as the long version. The individual administration of such instruments as the Piers Harris Self-Concept Scale

should also be considered. Attitude to school, at the grade three and six levels, could be measured by the Barker-Lunn Primary Children's Attitude Scale or the My Class Inventory. At the grade one level The Oral School Attitude Test or a modification of the Barker-Lunn are possible sources of attitude measures.

(5) Whenever self-report data are collected, an attempt should be made to obtain as many measures of the same variable by as wide a variety of means as possible. For example, pupil attitude to school could be obtained by a self-report score, by teacher, parent and peer ratings, followed by an individual interview.

(6) In view of the prominence of ability (measured by the Lorge-Thorndike) and prior achievement (measured by Metropolitan Reading subtest) as predictors at the grade six level, other measures of the same variables could be used in an interaction study to examine their relative utility as predictors.

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Appendix A

The Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

Section 1. Summary of Categories

Section 2. Definitions of Modified Categories

Section 3. Intercoder Reliability Measures

Section 4. Coding Sheet

Section 5. Frequency Variables Calculated from Interaction Categories

Section 1

Summary of Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

The major aspects of classroom life coded by this system are represented by the four cells in the diagram appearing below. Within each cell are the sub-categories of those four aspects which are then further broken down into still smaller units.

	Public response opportunities	Private dyadic teacher-pupil contacts
Teacher afforded	A.	C. l. Work-related ll. Personal lll. Procedure-related IV. Behavior-related V. Don't know
Student initiated	B. l. Student Initiated Questions ll. Student Initiated Comments	D. l. Work-related ll. Personal-related lll. Don't know

A. Teacher Afforded Response Opportunities

The three key aspects of this category of classroom event are:

(a) they are public interactions between the teacher and a child, intended to be monitored by the class or group with which the teacher is working;

(b) they occur when the teacher asks a question requiring either a verbal or nonverbal response;

(c) only one child makes the response.

For each response opportunity that is coded, information has to be checked off in each of four subcategories: (1) type of response opportunity; (2) level of question asked; (3) quality of child's answer; (4) nature of the teacher's feedback reaction.

(1) Types of response opportunity

Predesignated (PRE):	teacher names the child first and then asks a question;
Non volunteer (N. VOL):	teacher asks a question first but calls for a response from a child who has not raised his hand;
Volunteer (VOL):	teacher asks a question first and invites a response from a child with hand raised;
Called out (CALL):	teacher asks a question but a child calls out the answer before the teacher has a chance to select a respondent; the teacher nevertheless responds to the child who called out the answer.

(2) Level of question asked

Process (PCSS):	question requiring student to integrate facts or show knowledge of their relationships.
Product (PROD):	question for which a specific correct answer is sought.
Choice (CHOIS):	question requiring an answer to be selected from one of the alternatives presented.
Self Reference (SELF REF):	question requiring child to make a non-academic contribution to the classroom discussion. This type of question has then to be further classified as subject-matter related (SUB) or non subject-matter related (NON SUB) and

then whether it requires the child to show a preference (PREF) or to give information about his past experience (EXP).

Opinion: question requiring student to take a position on an issue or to predict the outcome of an experiment or hypothetical situation. If the child gives no response (NR) this is coded. On the other hand if the child does respond, the teacher's reaction to the answer is coded: if it is praised($\overline{+}$), criticized ($\overline{-}$), ignored (0), accepted (ACPT), integrated (INTEG) into the ongoing discussion, or if the teacher disagrees (DISAG) with the child's opinion.

(3) Quality of child's answer

The child's answer is coded as correct (+), partially correct (±), incorrect (-), or no response (NR) but, if the child indicates that he doesn't know, this item of information is also coded.

(4) Nature of the teacher's feedback response.[1]

The teacher's reaction to the child's response has been categorized as terminal or sustaining. Reaction which is terminal, that is, it has the effect of terminating the interaction with the child, could be one of seven types. The teacher may praise ($\overline{+}$), criticize ($\overline{-}$), provide no response (NR), give process feedback (PCSS), give the correct answer (GIV ANS), ask another (ASK OTH), child for the answer, or the answer may be called out (CALL) by another student. Reaction which is sustaining, that is, it has the effect of prolonging the interaction, could be one of three kinds. The teacher may repeat the question (REPT Q), rephrase the question or give a clue (REP or CLU), or ask a new question (NEW Q).

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[1] Modifications to the subcategories of teacher feedback as defined in the Expanded Brophy-Good System were made and are reported in Appendix A, Section 2.

B. Student Initiated Response Opportunities

I. Student Initiated Questions

This category of response opportunity is used if the student asks the teacher a question regarding the subject matter under discussion or some other matter. If the student calls out (CALL) the question without prior teacher approval, this point is coded and also if the question is relevant (REL) or irrelevant (IRREL). Two kinds of teacher reaction to the question, praise (+) and criticism (-), are coded if they occur, and also types of teacher feedback. The teacher may provide no feedback (0) (i.e., ignore the question), delay (DELAY) her answer, not accept (NACPT) it into the discussion, provide a brief or long answer or she may redirect (RDRCT) the question to another student. Three other categories praise (+), criticism (-), and warning (WARN) are provided if the teacher makes a reaction related to the student's behavior in initiating the question.

II. Student Initiated Comments

The details surrounding a student initiated comment that are coded are very similar to those for a student initiated question. All but three teacher response categories, brief, long, and redirect (RDRCT) are retained. They are replaced by another three. The teacher may accept (ACPT) the student comment, integrate (INTEG) it into the class discussion, or may use it to shift the direction of the class discussion.

C. Teacher Afforded Dyadic Contacts

I. Teacher Afforded Contacts (Work-related)

These are instances when the teacher makes private contact with an individual child about his work. Several features of these contacts are coded. The contact may be long, brief or it may be one in which the teacher just observes (OBSV) without entering into verbal interaction. If the contact is a long or brief one, praise (+), or criticism (-) is coded also if the teacher's comments include such reactions. A don't know (?) category is used if the interaction between teacher and child is not audible to the coder.

II. Teacher Afforded Contacts (Personal)

These contacts do not involve either work content or procedure but are of a strictly personal nature.

III. Teacher Afforded Contacts (Procedure-related)

Within this category a distinction is made between those instances when a teacher seeks a favor (child helps in running the classroom) and those in which the request have to do with getting the child ready to work. The latter are coded as management (MANAG). Thank you (THANKS) is coded if the teacher thanks the child following the management or favor request.

IV. Teacher Afforded Contacts (Behavior-related)

This category is used whenever the teacher makes some comment on the child's classroom behavior. They are subdivided into praise (+), non-verbal intervention (NVI), warnings (WARN), and criticism (-). Errors which the teacher makes when warning a child are also noted. Three kinds of errors, target errors (TARG), timing errors (TIM), and overreactions (OVERT) are coded. The no error category is used whenever the teacher does not make one of the three errors. Provision also exists for the coder to record his uncertainty (?) if he is not sure that an error has occurred.

V.

Don't know (?) is coded if the teacher-pupil communication is inaudible to the coder and the coder is unable to determine which of the above four types of teacher afforded contacts is occurring.

D. Student Initiated Dyadic Teacher-Pupil Contacts (referred to as Child Created Contacts on the coding sheets)

I. Child Created Contacts (Work-related)

This type of contact may relate to work content (CONT) or work procedures (PROC). The teacher's feedback to the child is also coded, whether the teacher offers praise (+) or criticism (-) and whether the contact is brief, long, or delayed (DELAY) by the teacher.

II. Child Created Contacts (Personal-related)

In this category there are two first-order divisions, experience (EXP) sharing and procedural (PROC). All experience sharing contacts are personal ones in which the student contacts the teacher to tell him something which is not related to either classroom work or procedure. The teacher's response is coded as either acknowledged (ACK) (i.e. the contact is acknowledged by the teacher) or delay (i.e. the teacher indicates she is unable to listen or talk to the pupil at that time).

A procedural contact occurs when the pupil is making a request, offers to do an errand, or reminds the teacher of something. The teacher's reaction is coded as grant or non-grant (N GRANT) (teacher has or has not granted the request) or as delay.

III. Don't Know

If the communication in the child created contact is inaudible to the coder, the don't know (?) column is used.

Section 2

Definitions of One Modified Category and Two New Categories in the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

No Feedback Reaction (0)

This category of terminal teacher feedback in the Brophy-Good system has been restricted in meaning in this study. This part of the original statement now embodies its full meaning.

> "If the teacher makes no response whatsoever following the child's answer to the question, he is coded for no feedback reaction (0). This means that he makes no verbal response to the child and does not communicate affirmation or negation by shaking his head in response to the answer. Instead, he merely moves on to something else, perhaps by starting to make a new point or by asking another child a question. Most coders will be surprised to find that this category is used much more often than they had expected. It frequently happens that the teacher makes no feedback reaction at all to the child's answer, especially in fast moving question drills where he is pushing to get correct answers in an impersonal fashion, without paying attention to the individual child giving the answer" (Brophy & Good, 1970, p.17).

Affirmative Teacher Reaction (AFFIRM)

This category of teacher reaction within an academic response opportunity is defined as a terminal teacher reaction which does not go beyond the level of simple affirmation. The teacher simply indicates that the child has given a correct response. He does not communicate a warm personal reaction to the child. There is merely an impersonal communication of information. For example, the teacher repeats the student's answer or thanks the pupil without explicit or implicit praise. The teacher's intent is to terminate student involvement.

Repeats Student Statement (REP SS)

This is an additional category in the set of teacher reactions in academic response opportunities described as sustaining. In this category are to be coded all those instances when the teacher repeats the child's answer in a quizzical manner without indicating whether he considers it to be correct or incorrect, or when the teacher restates the pupil answer for the purpose of having the student confirm what he had just said. The principal criterion to be used in distinguishing a Repeats Student Statement is whether the teacher's intention was to sustain the student's involvement by having the pupil clarify for himself and/or for others the meaning of his previous response.

Section 3

Intercoder Reliability Measures Obtained during Data Collection with the Low Inference Classroom Observation System

	Percentage Agreement												
	Coders 1 & 2			Coders 1 & 3						Coders 2 & 3			
Variable Check No.	1	2	3	1	2	3	4	5	6	1	2	3	4
Academic Response Opportunity													
Type of Respondent	50*	85	--†	20	50	33	79	0	--	50	91	71	--
Question Type	88	86	--	33	55	50	83	33	--	77	89	82	33
Child Answer	50	85	--	33	52	33	89	100	--	50	90	75	--
T. Feedback on PCSS, PROD, CHOIS	50	73	--	25	66	33	74	100	--	39	76	69	--
T. Feedback on Opinion Q's	--	--	--	0	18	100	100	--	--	--	60	--	--
Student Initiated Question													
Type	72	--	--	--	50	0	57	100	43	33	--	--	40
Relevancy	72	--	--	--	50	33	71	50	60	33	--	--	60
T. Feedback	63	--	--	--	50	33	71	100	29	33	--	--	60
Student Initiated Comment													
Type	33	0	100	67	50	50	42	71	40	43	40	20	50
Relevancy	45	0	100	50	50	29	56	75	60	71	80	100	44
T. Feedback	56	0	100	33	--	27	13	57	100	71	50	60	44
Dyadic Contact													
Type	84	100	73	67	20	56	85	88	83	73	56	63	89
Child Created Contact (CCC)													
Type	62	--	69	100	0	39	40	81	80	100	0	100	80
CCC (WK-REL)													
T. Reaction (DELAY, BRIEF, LONG)	56	--	41	75	--	29	50	79	67	0	0	100	71
T. Reaction (‡, ∓)	--	--	--	--	--	100	--	--	0	--	--	--	--
CCC (PERS-REL)													
Type	0	--	17	--	0	20	0	58	38	0	--	100	50
T. Reaction (ACK, DELAY)	--	--	0	--	0	20	--	33	33	0	--	--	0
T. Reaction (GRANT, NONGRANT)	0	--	20	--	--	--	0	33	--	0	--	100	20
Teacher Afforded Contact (TAC)													
Type	76	100	74	59	22	42	77	90	55	67	43	80	85
TAC (WK-REL)													
Type (OBSV, BRIEF, LONG)	46	--	33	25	--	--	67	83	50	--	--	60	40
T. Reaction (‡, ∓)	--	--	--	0	--	--	--	43	60	--	--	--	100
TAC (PROC-REL)													
Type (MANAG, FAVOR)	56	--	50	60	22	33	100	88	20	100	0	100	89
TAC (BEH-REL)													
Type (‡, NVI, WARN, ∓)	0	100	0	20	0	40	50	50	50	0	57	50	50
Error Type	0	100	0	60	--	33	50	78	50	0	45	100	50

[*] Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

[†] A dash in a cell represents 100% agreement between coders that the event did not occur.

Intercoder Reliability Measures Obtained During Training with the
Low Inference Classroom Observation System

	Percentage Agreement														
	Coders 1 & 2					Coders 1 & 3					Coders 2 & 3				
Variable — Check No.	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Academic Response Opportunity															
Type of Respondent	82	100*	70	--†	--	82	70	55	--	--	80	70	78	--	--
Question Type	73	75	71	--	--	36	100	33	--	--	30	75	33	--	--
Child Answer	85	80	64	--	--	69	89	58	--	--	64	80	78	--	--
T. Feedback on PCSS, PROD, CHOIS	43	67	50	--	--	60	78	71	--	--	60	67	78	--	--
T. Feedback on Opinion Q's	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Student Initiated Question															
Type	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Relevancy	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T. Feedback	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Student Initiated Comment															
Type	100	--	--	--	--	66	--	--	--	--	66	--	--	--	--
Relevancy	100	--	--	--	--	66	--	--	--	--	66	--	--	--	--
T. Feedback	66	--	--	--	--	66	--	--	--	--	66	--	--	--	--
Dyadic Contact															
Type	100	--	--	65	86	64	--	--	76	92	64	--	--	84	92
Child Created Contact (CCC)															
Type	100	--	--	90	83	0	--	--	87	95	0	--	--	96	79
CCC (WK-REL)															
T. Reaction (DELAY, BRIEF, LONG)	100	--	--	79	86	0	--	--	100	88	0	--	--	79	78
T. Reaction (‡, ∸)	--	--	--	--	56	--	--	--	--	45	--	--	--	--	78
CCC (PERS-REL)															
Type	--	--	--	25	50	--	--	--	43	50	--	--	--	50	75
T. Reaction (ACK, DELAY)	--	--	--	--	0	--	--	--	--	100	--	--	--	--	0
T. Reaction (GRANT, NONGRANT)	--	--	--	25	33	--	--	--	43	0	--	--	--	50	0
Teacher Afforded Contact (TAC)															
Type	89	--	--	45	73	58	--	--	60	92	57	--	--	71	73
TAC (WK-REL)															
Type (OBSV, BRIEF, LONG)	--	--	--	31	60	--	--	--	32	50	--	--	--	59	67
T. Reaction (‡, ∸)	--	--	--	33	--	--	--	--	33	--	--	--	--	100	--
TAC (PROC-REL)															
Type (MANAG, FAVOR)	78	--	--	56	33	78	--	--	78	100	100	--	--	45	33
TAC (BEH-REL)															
Type (‡, NVI, WARN, ∸)	0	--	--	67	60	20	--	--	57	50	0	--	--	71	33
Error Type	0	--	--	67	60	20	--	--	57	50	0	--	--	71	33

---

*Percentage agreements which are underlined indicate calculations based on frequencies of less than 10 for a given event.

†A dash in a cell represents 100% agreement between coders that the event did not occur.

Section 4

SCHOOL: ____________ DATE: ____________ START: ____________ PAGE: ____________
TEACHER: ____________ OBSERVER: ____________ STOP: ____________ OF : ____________

	SELF					OPINION							TIME	CHILD				QUEST			ANSWER					ACADEMIC TERMINAL FEEDBACK								SUSTAIN			
	SUB			NON SUB																																	
	PREF	EXP	?	PREF	EXP	NR	++	--	0	DISAG	ACPT	INTEG		PRE	NVOL	VOL	CALL	PCSS	PROD	CHOIS	+	+-	-	DK	NR	++	--	0	AFFIR	PCSS	GIVANS	ASKOTH	CALL	REPTQ	REPCLU	NEWG	REPSS
1																																					
2																																					
3																																					
4																																					
5																																					

STUDENT INITIATED QUESTIONS

CALL	REL	IRREL	++	--	0	DELAY	NACPT	BRIEF	LONG	RDRCT	++	--	WARN

STUDENT INITIATED COMMENTS

CALL	REL	IREL	++	--	0	DELAY	NACPT	ACPT	INTEG	SHIFT	++	--	WARN

TEACHER-AFFORDED CONTACTS

	WORK - RELATED							PROCEDURE			?	BEHAVIOR - RELATED								
	++	--	?	OBSV	BRIEF	LONG	PERS	FAVOR	MANAG	THANKS		++	NVI	WARN	--	NO ERROR	TARG	TIM	?	OVERT
1																				
2																				
3																				
4																				
5																				

CHILD-CREATED CONTACTS

WORK - RELATED							?	PERSONAL - RELATED					
CONT	PROC	++	--	DELAY	BRIEF	LONG		EXP	PROC	ACK	GRANT	DELAY	NGRANT

Section 5

Frequency Variables Derived from the Expanded Brophy-Good Teacher-Pupil Dyadic Interaction Classroom Observation System

Part I

Frequency of Interaction

Teacher Initiated Public Interaction

a) Nature of Pupil Identification

1. Volunteer to process questions
2. Volunteer to product and choice questions
3. Total volunteer in academic response opportunities
4. Non-volunteer to process questions
5. Non-volunteer to product and choice questions
6. Total non-volunteer in academic response opportunities
7. Pre-selected for process questions
8. Pre-selected for product and choice questions
9. Total pre-selected
10. Call out answer to process questions
11. Call out answer to product and choice questions
12. Total call outs
13. Total academic response opportunities

b) Question Type

14. Number of self reference questions
15. Number of opinion questions
16. Number of process questions
17. Number of product and choice questions
18. Total response opportunities (includes self reference and opinion questions)

Pupil Initiated Public Interaction

19. Number of relevant student initiated comments (SIC)
20. Number of irrelevant SIC
21. Total SIC
22. Number of relevant student initiated questions (SIQ)
23. Number of irrelevant SIQ
24. Total SIQ
25. Number of relevant student initiated public interactions
26. Number of irrelevant student initiated public interactions
27. Total student initiated public interactions

Teacher Initiated Private Interaction

28. Number of teacher afforded contacts (TAC) which are work related
29. Number of TAC which are personal related
30. Number of TAC which are procedural related
31. Number of behavioral warnings involving no error
32. Number of behavioral warnings involving error
33. Number of behavior warnings
34. Number of behavioral contacts which are non-verbal (NVI)
35. Total TAC which are behavior related
36. Number of TAC nature unknown ("?")
37. Total TAC which are not behavior related
38. Total TAC

Pupil Initiated Private Interaction

39. Number of child created contacts (CCC) which are work related
40. Number of CCC nature unknown ("?")
41. Number of CCC which are experience related
42. Number of CCC which are procedure related
43. Total CCC which are personal (experience + Procedure)
44. Total CCC

Combined Variables (teacher public and private + pupil public and private)

45. Total public contacts
46. Total private contacts
47. Total teacher initiated contacts
48. Total teacher initiated non-behavioral contacts
49. Total pupil initiated contacts
50. Total academic contacts
51. Total non-academic contacts
52. Total dyadic contacts

Part II

Quality of Pupil Answers

53. Correct answers to process questions when volunteer + call
54. Correct answers to process questions when non-volunteer + pre-select
55. Total correct answers to process question
56. Correct answers to product and choice questions when volunteer + call
57. Correct answers to product + choice questions when non-volunteer + pre-select

58. Correct answers to product + choice questions
59. Number of correct answers
60. Number of partly correct answers
61. Number of wrong answers
62. Number of "don't know" responses
63. Number of times pupil does not respond ("no response")
64. Number of times pupil fails to answer correctly

Part III

Teacher Reaction to Pupil Participation

Opinion Question

65. Number of opinion questions involving praise
66. Number of opinion questions involving no feedback
67. Number of opinion questions accepted (includes integrates)
68. Number of opinion questions integrated
69. Number of opinion questions where teacher disagrees

Academic Response Opportunities

Correct answers

70. Number of correct answers praised
71. Number of correct answers given no feedback
72. Number of correct answers affirmed
73. Number of correct answers given sustaining feedback

Partly correct answers

74. Number of correct answers praised
75. Number of correct answers given no feedback
76. Number of partly correct answers given process feedback
77. Number of partly correct answers followed by giving answer
78. Number of partly correct answers followed by asking another pupil
79. Number of partly correct answers followed by repeating question
80. Number of partly correct answers followed by a rephrase or clue
81. Number of partly correct answers followed by a new question
82. Number of partly correct answers followed by repeating student statement
83. Total terminal feedback following partly correct answers
84. Total sustaining feedback following partly correct answers

Wrong answers

85. Number of wrong answers given no feedback
86. Number of wrong answers given process feedback
87. Number of wrong answers followed by giving answer
88. Number of wrong answers followed by asking another pupil
89. Number of wrong answers followed by repeating question
90. Number of wrong answers followed by a rephrase or clue
91. Number of wrong answers followed by a new question
92. Number of wrong answers followed by repeating student statement
93. Total terminal feedback following wrong answers
94. Total sustaining feedback following wrong answers

Don't know (DK) and no response (NR)

95. Number of DK + NR given no feedback
96. Number of DK + NR given process feedback
97. Number of DK + NR followed by giving answer
98. Number of DK + NR followed by asking another pupil
99. Number of DK + NR followed by repeating question
100. Number of DK + NR followed by rephrase or clue
101. Number of DK + NR followed by a new question
102. Total terminal feedback following DK + NR
103. Total sustaining feedback following DK + NR

Failure to answer correctly

104. Number of times praised after failure to answer correctly
105. Number of times given no feedback after failure to answer correctly
106. Number of times given process feedback after failure to answer correctly
107. Number of times teacher gives answer after failure to answer correctly
108. Number of times teacher asks another after failure to answer correctly
109. Number of times teacher repeats question after failure to answer correctly
110. Number of times teacher rephrases or clues after failure to answer correctly
111. Number of times teacher asks new question after failure to answer correctly
112. Number of times teacher repeats student statement after failure to answer correctly
113. Total terminal feedback following failure to answer correctly.

114. Total sustaining feedback following failure to answer correctly

Student Initiated Comments (SIC)

115. Number of SIC relevant followed by praise
116. Number of SIC relevant followed by criticism
117. Number of SIC relevant given no feedback
118. Number of SIC relevant delayed
119. Number of SIC relevant not accepted
120. Number of SIC relevant accepted (includes integrated + shift)
121. Number of SIC relevant inegrated (includes shift)
122. Number of SIC relevant involving behavioral praise
123. Number of SIC relevant involving behavioral criticism
124. Number of SIC relevant involving warning
125. Number of SIC irrelevant followed by criticism
126. Number of SIC irrelevant given no feedback
127. Number of SIC irrelevant delay
128. Number of SIC irrelevant not accepted
129. Number of SIC irrelevant accepted (includes integrated + shift)
130. Number of SIC irrelevant integrate (includes shift)
131. Number of SIC irrelevant involving behavioral praise
132. Number of SIC irrelevant involving behavioral criticism
133. Number of SIC irrelevant involving warning
134. Total SIC followed by praise
135. Total SIC followed by criticism of comment
136. Total SIC given no feedback
137. Total SIC delayed
138. Total SIC not accepted
139. Total SIC accepted (includes integrated + shift)
140. Total SIC integrated (includes shift)
141. Total SIC involving behavioral praise
142. Total SIC involving behavioral criticism
143. Total SIC involving warning

Student Initiated Questions (SIQ)

144. Number of SIQ relevant followed by praise
145. Number of SIQ relevant given no feedback
146. Number of SIQ relevant delayed
147. Number of SIQ relevant not accepted
148. Number of SIQ relevant given brief answer
149. Number of SIQ relevant given long answer
150. Number of SIQ relevant redirected
151. Number of SIQ relevant involving warning
152. Number of SIQ irrelevant followed by criticism
153. Number of SIQ irrelevant delayed

154. Number of SIQ irrelevant not accepted
155. Number of SIQ irrelevant given brief answer
156. Number of SIQ irrelevant given long answer
157. Total SIQ followed by praise
158. Total SIQ followed by criticism
159. Total SIQ given no feedback
160. Total SIQ delayed
161. Total SIQ not accepted
162. Total SIQ given brief answer
163. Total SIQ given long answer
164. Total SIQ redirected
165. Total SIQ involving warning.

Student Initiated Public Interaction (SIC + SIQ)

166. SIPI followed by academic praise
167. SIPI followed by academic criticism
168. SIPI involving behavioral praise
169. SIPI involving behavioral criticism
170. SIPI given no feedback
171. SIPI not accepted
172. SIPI accepted (includes integrated + shift)

Teacher Initiated Private Interaction

173. Number of work related teacher afforded contacts (TAC) involving praise
174. Number of work related TAC involving criticism
175. Number of work related TAC involving long attention
176. Number of work related TAC involving brief attention (includes observe)
177. Number of procedure related TAC with thanks
178. Number of procedure related TAC without thanks
179. Number of behavior related TAC involving praise
180. Number of behavior related TAC involving criticism

Pupil Initiated Private Interaction

181. Number of work related child created contacts (CCC) involving praise
182. Number of work related CCC involving criticism
183. Number of work related CCC involving brief attention
184. Number of work related CCC involving long attention
185. Number of work related CCC which are delayed

Part IV

Teacher Reaction to Pupil Participation (Combined Data)

186. Total public response opportunities involving academic praise

187. Total public interaction involving no feedback from teacher
188. Total work related private interaction involving academic praise
189. Total private interaction (work related) involving long attention by teacher
190. Total private interaction (work related) involving brief attention by teacher
191. Total work related dyadic interaction involving academic praise
192. Total work related dyadic interaction involving academic criticism
193. Total dyadic interaction involving behavioral praise
194. Total dyadic interaction involving behavioral criticism
195. Total teacher responses showing high levels of respect or warmth
196. Total teacher responses showing low levels of warmth and empathy
197. Total teacher responses showing high levels of empathy

Appendix B

C.A.S.E.S.

Section 1. Summary of Categories in the Low Inference C.A.S.E.S. Observational System

Section 2. Inter-rater reliability, this study

Section 3. C.A.S.E.S. Coding Sheet

Section 4. C.A.S.E.S. Calculation Summary

Section 1

Summary of Categories in the Coping Analysis Schedule For Educational Settings (CASES)

1 *Aggressive Behavior*: Direct attack - grabbing, pushing, hitting, pulling, kicking, name-calling; destroying property - smashing, tearing, breaking.

2 *Negative (Inappropriate) Attention-Getting Behavior*: Annoying, bothering, whining, loud talking (unnecessarily), attention-getting aversive noise-making, belittling, criticizing.

3a or 3B *Manipulating, Controlling, and Directing Others*: Manipulating, bossing, commanding, directing, enforcing rules, conniving, wheedling, controlling.

4 *Resisting*: Resisting, delaying; passive agressive behavior; pretending to conform, conforming to the letter but not the spirit; defensive checking.

5a or 5b *Self-Directed Activity*: Productive working; reading, writing, constructing with interest; self-directed dramatic play (with high involvement).

6a or 6b *Paying Close Attention; Thinking, Pondering*: Listening attentively, watching carefully; concentrating on a story being told, a film being watched, a record played; thinking, pondering, reflecting.

7a or 7b *Integrative Sharing and Helping*: Contributing ideas, interests, materials, helping; responding by showing feelings (laughing, smiling, etc.) in audience situations; initiating conversation.

8a or 8b *Integrative Social Interaction*: Mutual give and take, cooperative behavior, integrative social behavior; studying or working together where participants are on a par.

9a or 9b *Integrative Seeking and Receiving Support, Assistance, and Information*: Bidding or asking teachers or significant peers for help, support, sympathy, affection, etc., being helped; receiving assistance.

10 *Following Directions Passively and Submissively*: Doing assigned work without enthusiasm or great interest; submitting to requests; answering direct questions; waiting for instructions as directed.

11 Observing Passively: Visual wandering with short fixations; watching others work; checking on noises or movements; checking on activities of adults or peers.

12 Responding to Internal Stimuli: Daydreaming; sleeping rocking or fidgeting (not in transaction with external stimuli).

13 Physical Withdrawal or Passive Avoidance: Moving away; hiding; avoiding transactions by movement away or around; physical wandering avoiding involvement in activities.

Section 2-a

Training Period Reliability Checks[1] of the Three CASES Observers[2] Using Spaulding's Training Tape[3]

Prior to study

Date	Subject	Observer Percentage Agreement with protocol		
		A	B	C
April 14	Fred	80.77	73.08	65.38
	Wayne	51.02	46.15	63.27
April 15	Fred	80.77	80.77	69.23
	Wayne	71.43	53.06	67.35
April 16	Fred	88.46	78.85	73.08
	Wayne	79.59	75.51	71.43
April 17	Fred	96.15	88.46	80.77
	Wayne	95.92	83.67	87.76
	$\bar{X}$	80.51	72.44	72.28
	GRAND $\bar{X}$	75.08		

During the study

Date	Subject	Observer Percentage agreement with protocol		
		A	B	C
May 6	Fred	96.15	94.23	96.15
	Wayne	87.76	91.84	83.67
May 17	Fred	96.15	94.23	91.15
May 19	Fred	94.23	90.38	86.54
	Wayne	83.67	89.80	91.84
	$\bar{X}$	91.59	92.10	85.87
	GRAND $\bar{X}$	89.85		

---

[1] Percentage agreement with protocol

[2] Observers A, B and C

[3] In both teacher-directed and non-directed settings

Section 2-b

Reliability Checks of the Three CASES Observers[1] Live Coding in Practice Classroom Prior to Study[2]

	Observer Percentage agreement with prorocol A	B	C	Combined
Ɛ of percentages over 36 observations	2389.34	2374.94	2356.11	2836.30
$\bar{X}$	66.37	65.94	65.44	78.78
Average of paired means 65.92				

---

[1] Observers A, B, & C

[2] In both teacher directed and non-directed settings

Section 2-c

Reliability Checks of the Three CASES Observers Using Selected Students During the Study

Date	Grade	Setting	Agreement between Observer Pairs A + B	B + C
May 14	1	TD	68.00	-
	1	NTD	88.00	-
	6	TD	-	74.00
	6	NTD	-	80.00
May 17	3	TD	-	63.00
	3	NTD	-	82.00
May 19	3	TD	-	88.00
May 20	1	TD	78.00	-
	1	NTD	74.00	-
		$\bar{X}$	77.00	77.40
	GRAND	$\bar{X}$	77.22	

Section 3

Pupils
a.
b.
c.
d.
e.
f.

Date________

Setting_______

Subject_______

Sch/T__________

Obs___________

Time in____ Out_____

Codes__________

	1	2	3a	3b	4	5a	5b	6a	6b	7a	7b	8a	8b	9a	9b	10	11	12	13
1																			
2																			
3																			
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39																			
40																			
a																			
b																			
c																			
d																			
e																			
f																			

Section 4

CASES STYLES-Work Sheet

APPENDIX C

School____ Teacher____ Observer____ Date____

Subject (Child's code name)____ Setting____

CES f
1 ____
2 ____
3a ____
3b ____
4 ____
5a ____
5b ____
6a ____
6b ____
7a ____
7b ____
8a ____
____
9a ____
9b ____
10 ____
11 ____
12 ____
13 ____
Σf ☐ ①

STYLE A (Aggressive, manipulative)
c1 ____
c2 ____
c3b ____
c9b ____
Total A ____ ②
②x100/① = ☐ ③%
③/4 = ☐ ④
Visibility A

STYLE B (Peer oriented, non-conforming, resistant)
c4 ____
c5b ____
c7b ____
c8b ____
Total B ____ ⑪
⑪ x100/① = ☐ ⑫%
⑫ /25 = ☐ ⑬
Visibility B

STYLE C (Withdrawn)
c12 ____
c13 ____
Total C ____ ⑧
⑧x100/① = ☐ ⑨%
⑨/5 = ☐ ⑩
Visibility C

STYLE D (Peer dependent)
c6b ____
c11 ____
Total D ____ ⑤
⑤x100/① = ☐ ⑥%
⑥/20 = ☐ ⑦
Visibility D

STYLE E (Adult dependent)
c6a ____
c7a ____
c9a ____
Total E ____ ⑭
⑭ x100/① = ☐ ⑮%
⑮ /20 = ☐ ⑯
Visibility E

STYLE F (Social, productive)
c3a ____
c8a ____
Total F ____ ⑰
⑰ x100/① = ☐ ⑱%
⑱ /20 = ☐ ⑲
Visibility F

STYLE G (Inner-directed, task-oriented)
c5a____x 100/① = ☐ ⑳%
⑳ /35 = ☐ ㉑
Visibility G

STYLE H (Other-directed, task-oriented)
c10____x 100/① = ☐ ㉒%
㉒ /30 = ☐ ㉓
Visibility H

Overall Coefficient

(Range = 1 to 10)

ΣA____ x4=____
ΣB____ x3=____
ΣC____ x1=____
ΣD____ x2=____
ΣE____ x7=____
ΣF____ x10=____
Σc5a____ x8=____
Σc10____ x5=____
Σ____ Σ____ /100 = ☐ Overall Coeff.

Appendix C

Oral School Attitude Test

Section 1. The Instrument

Section 2. Factor Loading Matrix, Three factor Solution

Section 3. Factor Loading Matrix, Four factor Solution

Section 4. Three Factor Solutions: Rivera and this Study

Section 1

Oral School Attitude Test

Purpose

The Oral School Attitude Test was designed to indicate a pupil's perception of the school environment.

Test Description

The Oral School Attitude Test is composed of twenty-nine items which provide an overall score and three subscores.

Subtests

The author, Rivera, indicates the presence of three underlying dimensions.

Interpersonal relations. Items 4, 5, and 7 request the student indicate how he gets along with others in the school.

Student-instruction interaction. Items 2, 3, 8-16, 20-29, request the pupil's views on a variety of topics including relations with the teacher, and the pupil's perception of teacher feelings under a variety of circumstances.

General school factor. Items 1, 6, 17, 18, and 19 ask the pupil how he is doing in school relations with the principal and how he feels about the school in general.

Administration

The test is administered to a group of pupils by having the administrator read each item out loud. Each child is provided with a booklet, each page having a series of four faces which represent a range of feelings. The child places an X on the face which best represents his feelings. In place of a page number, a unique drawing is located at the bottom of each page so that the pupils place their responses on the appropriate set of faces.

Scoring

A value from one to four is assigned each of the four responses to a particular item. The total score is obtained by summing the numerical values assigned to each of his responses. The maximum score is 116; the minimum score is 29.

Validity/Reliability

The test was derived by Rivera from Dr. E. McCallon's *Written School Attitude Test* (see Appendix D). Items chosen were those which appeared to have content validity. The test-retest reliability coefficient obtained over a ten-day period was .77.

Source of Materials

Materials involved in the use of the *Oral School Attitude Test* were obtained from Learning Concepts, 2501 North Lamar, Austin, Texas.

Section 2

Factor Loading Matrix of the Three Factor Solution, Varimax Rotation, Oral School Attitude Test

(H**2 = Communalities)

Factor	H**2	1	2	3	H**2
Test 1	0.162	0.158	0.351	-0.116	0.162
Test 2	0.629	0.784	0.104	0.064	0.629
Test 3	0.412	0.613	0.094	0.164	0.412
Test 4	0.260	0.047	0.497	0.103	0.260
Test 5	0.283	0.200	0.384	0.308	0.283
Test 6	0.217	0.089	0.457	0.002	0.217
Test 7	0.330	-0.102	0.521	0.219	0.330
Test 8	0.239	0.030	0.482	-0.072	0.239
Test 9	0.453	0.469	0.477	0.073	0.453
Test 10	0.371	0.022	0.608	0.027	0.371
Test 11	0.385	0.549	0.271	-0.099	0.385
Test 12	0.250	-0.084	-0.031	0.491	0.250
Test 13	0.202	0.416	0.160	-0.054	0.202
Test 14	0.152	0.378	0.091	-0.034	0.152
Test 15	0.236	0.173	0.378	-0.252	0.236
Test 16	0.283	0.509	-0.011	-0.151	0.283
Test 17	0.192	0.095	0.397	-0.160	0.192
Test 18	0.014	0.117	-0.023	-0.014	0.014
Test 19	0.199	0.330	0.138	-0.266	0.199
Test 20	0.402	0.245	0.482	-0.332	0.402
Test 21	0.282	0.489	0.119	-0.169	0.282
Test 22	0.296	0.226	0.352	-0.348	0.296
Test 23	0.114	0.334	-0.032	-0.040	0.114
Test 24	0.343	-0.045	-0.013	0.584	0.343
Test 25	0.312	-0.191	0.226	0.474	0.312
Test 26	0.490	0.653	0.243	0.071	0.490
Test 27	0.363	0.020	-0.087	0.596	0.363
Test 28	0.210	0.298	-0.041	0.345	0.210
Test 29	0.305	0.475	0.256	-0.117	0.305
Tracer Variable		.053	-.147	0.004	
Variance		3.585	2.833	1.968	
% Total Variance		12.363%	9.767%	6.785%	
% Common Variance		42.755%	33.779%	23.466%	
Sum of Communalities		8.386			
Total Variance Accounted for		28.916			

Section 3

Factor Loading Matrix of the Four Factor Solution, Varimax Rotation, Oral School Attitude Test

(H**2 = Communalities)

Factor	H**2	1	2	3	4	H**2
Test 1	0.238	0.027	0.249	0.419	-0.018	0.238
Test 2	0.630	0.744	0.039	0.268	0.054	0.630
Test 3	0.513	0.702	0.119	-0.059	0.048	0.513
Test 4	0.261	0.039	0.477	0.149	0.099	0.261
Test 5	0.436	0.365	0.471	-0.245	0.145	0.436
Test 6	0.249	0.145	0.472	0.005	-0.070	0.249
Test 7	0.363	-0.003	0.576	-0.120	0.128	0.363
Test 8	0.251	0.056	0.478	0.071	-0.116	0.251
Test 9	0.455	0.454	0.431	0.246	0.049	0.455
Test 10	0.371	0.029	0.592	0.141	0.003	0.371
Test 11	0.385	0.481	0.190	0.333	-0.082	0.385
Test 12	0.312	-0.108	-0.024	0.016	0.547	0.312
Test 13	0.205	0.357	0.096	0.260	-0.030	0.205
Test 14	0.226	0.444	0.108	-0.050	-0.124	0.226
Test 15	0.237	0.119	0.316	0.258	-0.236	0.237
Test 16	0.427	0.591	0.008	-0.081	-0.268	0.427
Test 17	0.349	-0.081	0.268	0.520	-0.019	0.349
Test 18	0.316	-0.096	-0.157	0.499	0.180	0.316
Test 19	0.296	0.156	0.003	0.502	-0.140	0.296
Test 20	0.405	0.202	0.417	0.275	-0.339	0.405
Test 21	0.353	0.331	-0.010	0.489	-0.062	0.353
Test 22	0.309	0.121	0.255	0.379	-0.293	0.309
Test 23	0.133	0.253	-0.098	0.242	0.015	0.133
Test 24	0.364	-0.022	0.023	-0.080	0.597	0.364
Test 25	0.366	-0.204	0.236	0.035	0.518	0.366
Test 26	0.493	0.589	0.166	0.333	0.088	0.493
Test 27	0.366	0.073	-0.033	-0.155	0.579	0.366
Test 28	0.265	0.232	-0.083	0.190	0.410	0.265
Test 29	0.358	0.337	0.137	0.474	-0.029	0.358
Tracer Variable		0.007	-.048	-.055	-.270	
Variance		3.175	2.461	2.380	1.917	
% Total Variance		10.947%	8.488%	8.207%	6.610%	
% Common Variance		31.959%	24.781%	23.960%	19.300%	

Sum of Communalities 9.933

Total Variance Accounted for 34.252

Section 4

Comparison of Rivera's Three-Factor Solution
and this Study's Three-Factor Solution to the
Oral School Attitude Test

Rivera's Factors	Factors Derived in the Study Factor 1 Student-instruction interaction	Factor 2 Interpersonal relations instruction	Factor 3 Negative implication
#1 Interpersonal relations		4, 5, 7	
#2 Student-instruction interaction	2, 3, 11, 13, 14*, 16, 21, 23*, 26, 29	8, 9, 10, 15, 20, 22	12, 24, 25, 27, 28
#3 General school	18*, 19	1, 6, 17*	

* Denotes loadings less than .199

Appendix D

Written School Attitude Test

Section 1. The Instrument

Section 2. Factor Loading Matrix for the three factor solution

Section 3. Factor Loading Matrix for the four factor solution

Section 4. Three factor solutions: McCallon and this study

Section 5. Secondary analysis - Factor Analysis of the reduced instrument

Section 1

The Written School Attitude Test

Purpose

The Written School Attitude Test was designed to indicate a pupil's perception of the school environment.

Test Description

The Written School Attitude Test is composed of forty-six items which provide an overall score and three subscores.

Subtests

The author, McCallon, indicates the presence of three underlying dimensions.

Interpersonal relations. Items 1, 15, 19, 25, 26, 34, 35, 52, and 43, ask the student to indicate how well he and his schoolmates get along together.

Student-instruction interaction. Items 2-14, 16, 18, 28-33, 36, 38-40, and 44 request the pupil's views on a variety of topics including teacher actions, pupil perception of teacher feelings, and pupil feelings towards school work.

General school factor. Items 17, 20-24, 27, 37, 41, 45, and 46, deal in the main with pupil feelings about the school in general although a few specific items refer to the principal and teachers.

Administration

The test administrator first reads the instructions to groups or classes of pupils, and then each test item is read out loud. Each child is provided with a booklet, each page referring to a particular test item. The pupil places an X in a box specifying "Most of the Time," "Some of the Time," or "Not Very Often." This is, the pupil indicates how he feels about his school.

Scoring

A value from one to three is assigned each of the three responses to a particular item. The total score is obtained by summing the numerical values assigned to each of his responses. The maximum score is 138; the minimum score is 46.

Validity/Reliability

The Written School Attitude Test was derived from an earlier instrument composed of items obtained from a review of the literature and from pupil comments about school. Items involved appeared to have content validity and appeared to be associated with a dimension of the school environment. Three reliability studies reduced the instrument to forty-six items involving three underlying dimensions and a test-retest reliability coefficient of .78 over 14 days.

Source of Materials

Materials involved in the use of the Written School Attitude Test were obtained from Learning Concepts, 2501 North Lamar, Austin, Texas.

Section 2

Factor Loading Matrix of the Three Factor Solution Varimax Rotation, Written School Attitude Test

(H**2) = Communalities)

Factor	H**2	1	2	3	H**2
Test 1	0.131	0.128	-0.132	0.312	0.131
Test 2	0.452	0.256	-0.460	0.418	0.452
Test 3	0.231	0.425	-0.144	0.171	0.231
Test 4	0.338	0.442	0.321	-0.199	0.338
Test 5	0.209	0.299	-0.317	0.140	0.209
Test 6	0.109	-0.326	-0.019	-0.049	0.109
Test 7	0.012	0.078	-0.051	0.059	0.012
Test 8	0.358	0.563	0.102	0.173	0.358
Test 9	0.561	0.062	-0.686	0.295	0.561
Test 10	0.261	0.192	0.014	0.473	0.261
Test 11	0.179	0.086	-0.059	0.410	0.179
Test 12	0.430	0.271	-0.595	-0.049	0.430
Test 13	0.258	-0.152	0.485	0.001	0.258
Test 14	0.308	0.487	0.264	-0.029	0.308
Test 15	0.411	-0.012	0.641	-0.022	0.411
Test 16	0.400	0.446	0.178	0.411	0.400
Test 17	0.212	-0.323	-0.217	0.247	0.212
Test 18	0.382	0.400	-0.287	0.373	0.382
Test 19	0.319	0.043	0.561	-0.041	0.319
Test 20	0.413	0.581	-0.270	0.048	0.413
Test 21	0.353	0.580	-0.128	-0.007	0.353
Test 22	0.229	-0.006	-0.470	-0.090	0.229
Test 23	0.433	0.149	-0.252	0.589	0.433
Test 24	0.563	-0.099	0.121	0.734	0.563
Test 25	0.316	-0.075	0.542	0.126	0.316
Test 26	0.282	-0.064	0.528	0.013	0.282
Test 27	0.292	-0.045	-0.516	0.153	0.292
Test 28	0.458	0.670	-0.037	0.089	0.458
Test 29	0.197	0.231	-0.265	0.271	0.197
Test 30	0.134	0.204	0.250	-0.174	0.134
Test 31	0.567	0.552	0.244	0.450	0.567
Test 32	0.306	0.022	0.200	0.516	0.306
Test 33	0.318	0.514	-0.064	0.221	0.318
Test 34	0.332	0.535	0.140	0.161	0.332
Test 35	0.486	0.557	-0.407	0.100	0.486
Test 36	0.536	0.330	0.269	0.596	0.536
Test 37	0.269	0.082	0.247	0.449	0.269
Test 38	0.421	0.540	-0.354	-0.067	0.421

Cont.

Factor	H**2	1	2	3	H**2
Test 39	0.246	0.003	-0.190	0.458	0.246
Test 40	0.338	0.484	-0.191	0.259	0.338
Test 41	0.452	0.418	0.145	0.506	0.452
Test 42	0.343	0.154	0.530	0.195	0.343
Test 43	0.451	0.196	0.559	0.317	0.451
Test 44	0.202	0.142	0.179	0.388	0.202
Test 45	0.459	-0.074	-0.176	0.650	0.459
Test 46	0.597	0.582	-0.101	0.498	0.597
Variance		5.494	5.156	4.904	
% Total Variance		11.944%	11.208%	10.660%	
% Common Variance		35.324%	33.148%	31.527%	

Sum of Communalities = 15.554

Total Variance Accounted for = 33.813%

Section 3

Factor Loading Matrix of the Four Factor Solution Varimax Rotation, Written School Attitude Test

(H**2) = Communalities)

Factor	H**2	1	2	3	4	H**2
Test 1	0.166	0.122	0.313	0.022	0.229	0.166
Test 2	0.455	0.483	0.411	0.133	0.189	0.455
Test 3	0.231	0.194	0.179	0.374	0.147	0.231
Test 4	0.356	-0.254	-0.175	0.510	0.008	0.356
Test 5	0.272	0.305	0.141	0.134	0.376	0.272
Test 6	0.358	0.064	-0.065	-0.125	-0.578	0.358
Test 7	0.318	-0.030	0.066	-0.134	0.543	0.318
Test 8	0.380	-0.061	0.196	0.476	0.333	0.380
Test 9	0.577	0.709	0.272	-0.013	-0.020	0.577
Test 10	0.454	-0.050	0.484	0.010	0.466	0.454
Test 11	0.191	0.062	0.412	0.019	0.130	0.191
Test 12	0.502	0.654	-0.063	0.255	-0.077	0.502
Test 13	0.407	-0.554	0.016	-0.202	0.244	0.407
Test 14	0.341	-0.181	-0.006	0.555	-0.015	0.341
Test 15	0.436	-0.605	-0.002	0.144	-0.222	0.436
Test 16	0.423	-0.090	0.430	0.480	-0.004	0.423
Test 17	0.223	0.171	0.230	-0.376	-0.003	0.223
Test 18	0.395	0.317	0.377	0.274	0.277	0.395
Test 19	0.320	-0.541	-0.021	0.142	-0.086	0.320
Test 20	0.422	0.310	0.059	0.458	0.336	0.422
Test 21	0.499	0.248	0.004	0.650	-0.123	0.499
Test 22	0.277	0.493	-0.108	0.001	-0.148	0.277
Test 23	0.439	0.269	0.585	0.052	0.147	0.439
Test 24	0.721	-0.041	0.730	0.045	-0.430	0.721
Test 25	0.317	-0.542	0.142	-0.004	-0.053	0.317
Test 26	0.283	-0.525	0.029	0.018	-0.073	0.283
Test 27	0.447	0.570	0.129	0.013	-0.324	0.447
Test 28	0.483	0.083	0.111	0.554	0.396	0.483
Test 29	0.271	0.248	0.272	0.067	0.362	0.271
Test 30	0.257	-0.286	-0.156	0.109	0.373	0.257
Test 31	0.591	-0.143	0.474	0.588	0.026	0.591
Test 32	0.353	-0.212	0.525	-0.041	0.176	0.353
Test 33	0.466	0.185	0.231	0.594	-0.161	0.466
Test 34	0.405	-0.120	0.185	0.415	0.429	0.405
Test 35	0.486	0.458	0.104	0.443	0.264	0.486
Test 36	0.537	-0.205	0.615	0.338	0.053	0.537
Test 37	0.271	-0.226	0.460	0.084	0.034	0.271
Test 38	0.422	0.405	-0.062	0.454	0.220	0.422

Factor	H**2	1	2	3	4	H**2
Test 39	0.337	0.152	0.454	-0.147	0.293	0.337
Test 40	0.387	0.210	0.270	0.330	0.401	0.387
Test 41	0.453	-0.077	0.523	0.405	0.098	0.453
Test 42	0.521	-0.429	0.213	0.367	-0.395	0.521
Test 43	0.491	-0.485	0.340	0.328	-0.181	0.491
Test 44	0.202	-0.150	0.398	0.142	0.036	0.202
Test 45	0.503	0.220	0.639	-0.042	-0.211	0.503
Test 46	0.655	0.214	0.510	0.591	-0.004	0.655
Variance		5.235	5.030	4.862	3.176	
% Total Variance		11.380%	10.935%	10.570%	6.904%	
% Common Variance		28.600%	27.483%	26.564%	17.352%	

Sum of Communalities = 18.303

Total Variance Accounted for = 39.789%

Section 4

Comparison of McCallon's Three Factor Solution and this Study's Four Factor Solution[1] of the Written School Attitude Test[2]

McCallon's Factors	Factors derived in this Study Factor 1 "Interpersonal relations"	Factor 2 "General school"	Factor 3 "Student instruction interaction	Factor 4 "Positive supportive teacher"
	Items	Items	Items	Items
Factor 1. General School	22, 27	23, 24, 41, 45	20, 21, 46, 17	
Factor 2. Interpersonal relations	15, 19, 25 26, 35, 42, 43	1*		
Factor 3. Student instruction interaction	2, 9, 12, 13	10, 11*, 18 32, 36, 37 39, 44	3, 4, 8, 14, 16, 28, 31, 33, 38	5, 6, 7, 29, 30, 34 40

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[1] Principal axis factoring with 1's in the diagonal varimax rotation

[2] Full factor loading matrix appears in appendix D-3

* Items that contributed $<.2$ to the communality

Section 5

Written School Attitude Test
Seconday Investigation

Analysis

Since the original instrument's three subscores were based on a principal axis factoring and varimax rotation, the three-factor solution in this study was given additional attention. In addition, for reasons discussed in the primary investigation of the Written School Attitude Test (Chapter 5) there were a number of indicators that some test items of the Written School Attitude test did not seem to belong. As a result, three, four, and five-factor solutions were carried out on forty of the forty-six test items. Items 1, 6, 7, 11, 29, and 30, which contributed less than .2 to the communality of the three-factor solutions, were not included.

Findings

The three-factor solution of the reduced (40 item) Written School Attitude Test is almost identical to the three factor solution on the 46 items which was previously reported in Table 10. The four-factor solution, accounting for 43% of the variance, gave the most distinct factors of all the analyses carried out on this instrument, and is presented in Table D-5-1. A somewhat complex "Relations with the teacher" factor was derived along with the quite distinct "instruction", "Positive relations with people in the school" and "General school" factors. These same four factors and a more difficult to interpret fifth factor were obtained from the five-factor solution. The factor loading matrix of the four factor solution follows in this appendix.

Discussion

As in the analysis of the full instrument, the three-factor solution to the forty-item test contained some diverse items loading on each factor. Although interpretation was possible, it was not completely satisfactory. The emergence of four quite distinct factors underlying the reduced instrument seemed the most satisfactory solution in this study and seemed to support the suggestion expressed in the factor analysis of the full instrument that some items could be removed from the instrument. One was to accomplish this with more certainty would be to administer the instrument to a large sample and remove items that contributed little to the communality, for example, all items contributing less than .250.

Table D-5-1

Comparison of McCallon's Three Factor Solution and this Study's Four Factor Solution[1] of the Reduced 40 Item[2] Written School Attitude Test[3]

McCallon's Factors	Factors derived in this Study			
	Factor 1 "Relations with the teacher	Factor 2 "Instruction"	Factor 3 "Positive relations with all in school"	Factor 4 "General school"
	Items	Items	Items	Items
Factor 1. General School	20,21,46	41,22		17,23,24, 27,45
Factor 2. Interpersonal relations	35		15,19,25,26, 42,43	
Factor 3. Student instruction interaction	2,3,5,8,12 13,18,28,33 34,38,40	10,16,31,32 36,37,39,44	9,14	4

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[1] Principal axis factoring with l's in the diagonal, varimax rotation, N=50

[2] Items 1, 6, 7, 11, 29 and 30 of the original instrument were not included

[3] Factor loading matrix appears in appendix D-5-2

Table D-5-2

Factor Loading Matrix of the Four Factor Solution, Written School Attitude Test with some Test Items Removed

(H**2 = Communalities)

Test Item	H**2	1	2	3	4	H**2
2	0.426	0.400	0.195	-0.322	0.353	0.426
3	0.255	0.439	0.119	0.013	0.221	0.255
4	0.566	0.259	0.219	0.083	-0.666	0.566
5	0.184	0.359	0.048	-0.205	0.100	0.184
8	0.348	0.474	0.309	0.091	-0.140	0.348
9	0.515	0.296	0.012	-0.545	0.361	0.515
10	0.265	0.141	0.467	-0.026	0.164	0.265
12	0.525	0.500	-0.355	-0.275	0.270	0.525
13	0.306	-0.364	0.248	0.238	-0.237	0.306
14	0.416	0.448	-0.012	0.459	-0.067	0.416
15	0.490	-0.120	0.046	0.671	-0.152	0.490
16	0.443	0.384	0.528	0.101	-0.081	0.443
17	0.275	-0.278	0.134	-0.263	0.334	0.275
18	0.375	0.473	0.243	-0.168	0.254	0.375
19	0.347	-0.106	0.100	0.551	-0.151	0.347
20	0.386	0.601	0.047	-0.150	-0.002	0.386
21	0.390	0.622	0.019	0.011	-0.048	0.390
22	0.289	0.196	-0.364	-0.252	0.234	0.289
23	0.504	0.277	0.298	-0.058	0.579	0.504
24	0.673	-0.002	0.457	0.261	0.630	0.673
25	0.534	-0.138	0.000	0.702	0.149	0.534
26	0.346	-0.159	0.039	0.563	-0.042	0.346
27	0.466	0.221	-0.255	-0.193	0.561	0.466
28	0.515	0.589	0.305	-0.084	-0.260	0.515
31	0.591	0.480	0.558	0.212	-0.062	0.591
32	0.434	-0.106	0.647	-0.006	0.069	0.434
33	0.547	0.618	-0.000	0.294	0.280	0.547
34	0.304	0.446	0.239	0.191	-0.109	0.304
35	0.489	0.630	0.056	-0.295	0.054	0.489
36	0.540	0.255	0.661	0.187	0.049	0.540
37	0.313	-0.015	0.542	0.118	0.067	0.313
38	0.415	0.610	-0.120	-0.165	0.040	0.415

Cont.

Test Item	H**2	1	2	3	4	H**2
39	0.478	-0.035	0.546	-0.418	0.065	0.478
40	0.364	0.447	0.347	-0.205	0.034	0.364
41	0.454	0.363	0.558	0.101	0.016	0.454
42	0.398	0.086	0.225	0.583	-0.018	0.398
43	0.602	0.141	0.241	0.713	0.127	0.602
44	0.241	0.078	0.477	0.082	0.038	0.241
45	0.561	0.078	0.336	-0.014	0.665	0.561
46	0.657	0.635	0.404	0.062	0.294	0.657
Variance		5.673	4.442	4.092	3.023	
% Total Variance		14.183%	11.104%	10.229%	7.558%	
% Common Variance		32.927%	25.779%	23.748%	17.546%	

Sum of Communalities = 17.229

Total Variance accounted for = 43.074%

Appendix E

Primary Children's Attitude Test

C

STRICTLY CONFIDENTIAL

THIS WILL NOT BE SHOWN TO YOUR TEACHER OR PRINCIPAL

6

We have been talking to many boys and girls of your age. They have told us what they like and what they dislike about school.

Over the page you will see some of the things they have said. We would like to know what *you* feel and think about these things - whether you agree or disagree with what other boys and girls have said.

This is NOT a test and there are NO RIGHT and NO WRONG answers.

We want you to answer as truthfully as you can. Just say what you think is most true of you.

Your answers will be strictly *confidential*; this means we won't tell anyone your answers.

Here is an example:

	YES, OFTEN	SOMETIMES	NEVER
A. I like watching television			

If you *often* like watching television, put an X in the box marked *often*.

If you *sometimes* like watching television, put an X in the box marked *sometimes*.

Here is one for you to try:

	YES	NOT SURE	NO
B. I like playing football			

1. If I missed a gym lesson I would be disappointed	Yes	Not sure	No		
2. I'm sorry when school is over for the day	Always	Sometimes	Never		
3. It's nice to fool around in class	Often	Sometimes	Never		
4. Teacher gets on well with me	Most of the time	Sometimes	Hardly ever		
5. I get a lot of arithmetic questions wrong	Yes,often	Sometimes	Hardy ever		
6. When the teacher goes out of the room I play around	Always	Sometimes	Never		
7. I think I'm pretty good at school work	Yes	Not sure	No		
8. School lessons are boring	Most of the time	Sometimes	Never		
9. My class is nicest of all	Yes	Not sure	No		
10. I have no one to play with at recess	True,often	Sometimes	Never		
11. I would like to be better at gym than at school work	Yes	Not sure	No		
12. We spend too much time doing arithmetic	Yes,often	Sometimes	Hardly ever		

13.	*I'd rather be in my class than the other classes for my age*	Yes	Not sure	No		
14.	*I sometimes think I'm no good at anything*	Yes,true	Not sure	False		
15.	*Other classes think we're nice in my class*	Yes	Not sure	No		
16.	*I think a lot of children of my age would like to be in my class*	Yes	Not sure	No		
17.	*My teacher thinks I'm clever*	Yes	Not sure	No		
18.	*I bet going out to work is better than school*	Yes	Not sure	No		
19.	*I shall be sorry to leave my class*	Yes	Not sure	No		
20.	*I'm scared to ask my teacher for help when I don't understand*	Yes,often	Sometimes	Never		
21.	*I have no friends I like very much in my class*	Yes,true	Not sure	False		
22.	*I like people who get me into mischief*	Yes	Not sure	No		
23.	*I like doing hard arithmetic questions*	Yes,often	Sometimes	Never		
24.	*Teacher is always nagging me*	Yes	Not sure	No		

	Always	Sometimes	Hardly ever		
25. *School is boring*					
	Yes	Not sure	No		
26. *I'm happy to be in the class I'm in now*					
	Yes	Not sure	No		
27. *School work worries me*					
	Yes,often	Sometimes	Never		
28. *I feel scared when teacher asks me questions about my work*					
	Yes,true	Not sure	False		
29. *Other children think we're very clever in my class*					
	Most of the time	Sometimes	Hardly ever		
30. *When we have tests I get very good marks*					
	Most of the time	Sometimes	Hardly ever		
31. *We have interesting lessons in school*					
	Yes	Not sure	No		
32. *Children who can't do their schoolwork feel ashamed*					
	Yes	Not sure	No		
33. *I dislike children who are noisy in class*					
	Yes	Not sure	No		
34. *I hate being in the class I'm in now*					
	Yes	Not sure	No		
35. *I like children who get into trouble*					
	Yes	Not sure	No		
36. *Teacher is interested in me*					

37.	*My class gets blamed for things we don't do*	Yes, true	Not sure	False		
38.	*I would feel a little afraid if I got my spelling or arithmetic questions wrong*	Yes	Not sure	No		
39.	*I think the other children in my class like me*	Yes	Not sure	No		
40.	*I'd prefer to be in another class*	Yes	Not sure	No		
41.	*School is fun*	Always	Sometimes	Hardly ever		
42.	*I find a lot of school work is difficult to understand*	Yes, often	Sometimes	Hardly ever		
43.	*I would like to be one of the cleverest pupils in the class*	Yes	Not sure	No		
44.	*I work and try very hard in school*	Always	Most of the time	Sometimes		
45.	*I'm very good at doing arithmetic questions*	Always	Sometimes	Hardly ever		
46.	*I don't always get on well with some of the children in my class*	Yes, true	Not sure	False		
47.	*I enjoy most school work*	Yes	Not sure	No		
48.	*Going to school is a waste of time*	Yes	Not sure	No		

49. *My teacher is nice to me*	Most of the time	Sometimes	Hardly ever		
50. *I'm useless at school work*	Yes,often	Sometimes	Never		
51. *Teacher thinks I'm a trouble-maker*	Yes	Not sure	No		
52. *I would like to be very good at school work*	Yes	Not sure	No		
53. *Other children make fun of my class*	Often	Sometimes	Never		
54. *I think my teacher likes me*	Yes	Not sure	No		
55. *When people ask what class I'm in I always feel happy to tell them*	Yes	Not sure	No		
56. *I like school*	Yes	Not sure	No		
57. *I don't seem to be able to do anything really well in school*	Yes,true	Not sure	No		
58. *It would bother me if I got my work wrong*	Yes	Not sure	No		
59. *I like being in my class*	Yes	Not sure	No		
60. *I would leave school tomorrow if I could*	Yes	Not sure	No		

61. *I enjoy being asked questions by my teacher*	Yes	Not sure	No		
62. *Other classes think they're better than us*	Yes	Not sure	No		
63. *Doing well at school is most important to me*	Yes	Not sure	No		
64. *At school they make you do things you don't want to do*	Yes	Not sure	No		

A. *Which class would you rather be in at your school?* ________________

B. *Why?* ________________________________

Appendix F

Self-Esteem Inventory

Section 1. Form A Instrument (Gr. 3 + 6)

Section 2. Form B Instrument (Gr. 1)

Section 3. Factor loading matrix for the four factor solution

Section 4. Factor loading matrix for the five factor solution

Section 5. Procrustes match of grade one factors to grade three and six factors

Section 1

Student number ______________ Date ______________

Form A Practice

I would like to know how you feel about some things and you can tell me by putting checks (✓) on this paper. I'm going to call out each number and read out the sentence for you. If you do not understand a word or the sentence, ask me and I'll explain it to you. Please mark each statement in the following way.

If the statement describes how you usually feel, put a check (✓) in the column "like me".

If the statement does not describe how you usually feel, put a check (✓) in the column "not like me".

There are no right or wrong answers. This is not a test. Some answers will be in between "like me" and "not like me" so check one according to how you usually feel.

		Like Me	Not Like Me
A.	I play outside at recess	________	__________
B.	I've been in this room all year	________	__________
C.	I'm wearing something red today	________	__________
D.	I'm going away for a holiday this weekend	________	__________

Student number ____________ Date ____________ Room _______

Inventory, Form B

I would like to know how you feel about some things and you can tell me by putting checks (✓) on this paper. I'm going to call out each number and read out the sentence for you. If you do not understand a word or the sentence, ask me and I'll explain it to you. Please mark each statement in the following way.

If the statement describes how you usually feel, put a check (✓) in the column "like me".

If the statement does not describe how you usually feel, put a check (✓) in the column "not like me".

There are no right or wrong answers. This is not a test. Some answers will be in between "like me" and "not like me" so check one according to how you usually feel.

	Like Me	Not Like Me
1. I spend a lot of time daydreaming.	______	______
2. I'm pretty sure of myself.	______	______
3. I often wish I were someone else.	______	______
4. I'm easy to like.	______	______
5. My parents and I have a lot of fun together.	______	______
6. I never, never worry about anything.	______	______
7. I find it very hard to talk in front of the class.	______	______
8. I wish I were younger.	______	______
9. There are lots of things about myself I'd change if I could.	______	______
10. I can make up my mind without too much trouble.	______	______

	Like Me	Not Like Me
11. I'm a lot of fun to be with.	________	____________
12. I get upset easily at home.	________	____________
13. I always, always do the right thing.	________	____________
14. I'm proud of my school work.	________	____________
15. Someone always has to tell me what to do.	________	____________
16. It takes me a long time to get used to anything new.	________	____________
17. I'm often sorry for the things I do.	________	____________
18. I'm liked by kids my own age.	________	____________
19. My parents usually consider my feelings; they usually worry about how I feel before we do things.	________	____________
20. I'm never, never unhappy.	________	____________
21. I'm doing the best work that I can.	________	____________
22. I give in very easily.	________	____________
23. I can usually take care of myself.	________	____________
24. I'm pretty happy.	________	____________
25. I would rather play with children younger than me.	________	____________
26. My parents expect too much of me; they expect me to do very hard things.	________	____________
27. I like everyone I know; there is no one I don't like.	________	____________

		Like Me	Not Like Me
28.	I like to be called on in class.		
29.	I understand myself (I know what I can do and why I feel the way I do.		
30.	It's pretty tough to be me.		
31.	Things are all mixed up in my life.		
32.	Kids usually follow my ideas.		
33.	No one pays much attention to me at home.		
34.	I never, never get scolded.		
35.	I'm not doing as well in school as I'd like to.		
36.	I can make up my mind and stick to it.		
37.	I really don't like being a boy--girl.		
38.	I have a low opinion of myself. I don't think very much of myself.		
39.	I don't like to be with other people.		
40.	There are many times when I'd like to leave home.		
41.	I'm never, never shy.		
42.	I often feel upset in school.		
43.	I often feel ashamed of myself. I feel bad about myself.		
44.	I'm not as nice looking as most people.		

	Like Me	Not Like Me
45. If I have something to say, I usually say it.		
46. Kids pick on me very often.		
47. My parents understand me.		
48. I always, always tell the truth.		
49. My teacher makes me feel I'm not good enough.		
50. I don't care what happens to me.		
51. I'm a failure. I can't do anything right.		
52. I get upset easily when I'm scolded.		
53. Most people are better liked than I am.		
54. I usually feel as if my parents are pushing me.		
55. I always, always know what to say to people.		
56. I often get discouraged in school. School often seems hopeless to me.		
57. Things usually don't bother me.		
58. I can't be depended on. I can't be trusted to do the things I say I'm going to do.		

Section 2

Student number ________ Date __________ Room __________

Form B Practice

I would like to know how you feel about some things and you can tell me by putting checks (✓) on this paper. I'm going to call out each number and read out the sentences for you. If you do not understand a word or a sentence, ask me and I'll explain it to you. Please mark each section the following way.

There are two statements in every number. I want you to check (✓) only the one which tells how you usually feel. Check the one that is "Like You".

There are no right or wrong answers. This is not a test. Check (✓) one according to how you usually feel. Remember, you can only check one in each number.

1. (a) I play outside at recess ______
   (b) I don't play outside at recess ______

2. (a) I've been in this room all year ______
   (b) I haven't been in this room all year ______

3. (a) I'm wearing something red today ______
   (b) I'm not wearing anything red today ______

4. (a) I'm going away for a holiday this weekend ______
   (b) I'm not going away for a holiday this weekend ______

Student number __________ Date __________ Room ________

Inventory Form C

I would like to know how you feel about some things and you can tell me by putting checks (✓) on this paper. I'm going to call out each number and read out the sentences for you. If you do not understand a word or a sentence, ask me and I'll explain it to you. Please mark each section the following way.

There are two statements in every number. I want you to check (✓) only the one which tells how you usually feel. Check the one that is "Like You."

There are no right or wrong answers. This is not a test. Check (✓) one according to how you usually feel. Remember, you can only check one in each number.

1. (a) I spend a lot of time daydreaming. ______
   (b) I don't spend a lot of time daydreaming. ______

2. (a) I'm pretty sure of myself. ______
   (b) I'm not very sure of myself. ______

3. (a) I often wish I were someone else. ______
   (b) I seldom wish I were someone else. ______

4. (a) I'm easy to like.
   (b) I'm not easy to like.

5. (a) My parents and I have a lot of fun together. ______
   (b) My parents and I don't have much fun together. ______

6. (a) I never, never worry about anything. ______
   (b) I worry about some things. ______

7. (a) I find it very hard to talk in front of the class. ______
   (b) I don't find it very hard to talk in front of the class. ______

8. (a) I wish I were younger. ______
   (b) I wouldn't want to be younger. ______

9. (a) There are lots of things about myself I'd change if I could. ______
(b) There isn't much about myself I'd change if I could. ______

10. (a) I can make up my mind without too much trouble. ______
(b) I have a lot of trouble making up my mind. ______

11. (a) I'm a lot of fun to be with. ______
(b) I'm not much fun to be with. ______

12. (a) I get upset easily at home. ______
(b) I don't get upset easily at home. ______

13. (a) I always, always do the right thing. ______
(b) I don't always do the right thing. ______

14. (a) I'm proud of my school work. ______
(b) I'm not proud of my school work. ______

15. (a) Someone always has to tell me what to do. ______
(b) I don't usually need to be told what to do. ______

16. (a) It takes me a long time to get used to anything new. ______
(b) I get used to new things easily. ______

17. (a) I'm often sorry for the things I do. ______
(b) I'm not often sorry for the things I do. ______

18. (a) I'm liked by kids my own age. ______
(b) I'm not liked by kids my own age. ______

19. (a) My parents usually consider my feelings; they usually worry about how I feel before we do things. ______
(b) My parents do not consider my feelings; they do not worry about how I feel before we do things. ______

20. (a) I'm never, never unhappy. ______
(b) I'm unhappy sometimes. ______

21. (a) I'm doing the best work that I can. ______
(b) I'm not doing the best work that I can. ______

22. (a) I give in very easily. ______
(b) I don't give in very easily. ______

23. (a) I can usually take care of myself. ______
(b) I usually can't take care of myself. ______

24. (a) I'm pretty happy. ______
(b) I'm not very happy. ______

25. (a) I would rather play with children younger than me. ______
(b) I don't like to play with children younger than me. ______

26. (a) My parents expect too much of me; they expect me to do very hard things. ______

(b) My parents don't expect too much of me; they expect me to do only things I can do. ______

27. (a) I like everyone I know; there is no one I don't like. ______
(b) I don't like everyone I know; there are some people I don't like. ______

28. (a) I like to be called on in class. ______
(b) I don't like to be called on in class. ______

29. (a) I understand myself. I know what I can do and why I feel the way I do. ______
(b) I don't understand myself. I don't know what I can do or why I feel the way I do. ______

30. (a) It's pretty tough to be me. ______
(b) It's not very tough to be me. ______

31. (a) Things are all mixed up in my life. ______
(b) Things are not mixed up in my life. ______

32. (a) Kids usually follow my ideas. ______
(b) Kids don't usually follow my ideas. ______

33. (a) No one pays much attention to me at home. ______
(b) I get enough attention at home. ______

34. (a) I never, never get scolded. ______
(b) I get scolded sometimes. ______

35. (a) I'm not doing as well in school as I'd like to. ______
(b) I'm doing as well in school as I'd like to. ______

36. (a) I can make up my mind and stick to it. ______
(b) I can't make up my mind and stick to it. ______

37. (a) I really don't like being a boy--girl ______
(b) I really like being a boy--girl. ______

38. (a) I have a low opinion of myself. I don't think very much of myself. ______
(b) I'm happy with myself. ______

39. (a) I don't like to be with other people. ______
(b) I like to be with other people. ______

40. (a) There are many times when I'd like to leave home. ______
(b) There aren't many times when I'd like to leave home. ______

41. (a) I'm never never shy. ______
(b) I'm shy sometimes. ______

42. (a) I often feel upset in school. ______
(b) I don't often feel upset in school. ______

43. (a) I often feel ashamed of myself. I feel bad about myself. ______
(b) I seldom feel ashamed of myself. I feel good about myself. ______

44. (a) I'm not as nice looking as most people. ______
(b) I'm as nice looking as most people. ______

45. (a) If I have something to say, I usually say it. ______
(b) Even when I have something to say, I usually keep it to myself. ______

46. (a) Kids pick on me very often. ______
(b) Kids don't pick on me very much. ______

47. (a) My parents understand me. ______
(b) My parents don't usually understand me. ______

48. (a) I always, always tell the truth. ______
(b) I don't always tell the truth. ______

49. (a) My teacher makes me feel I'm not good enough. ______
(b) My teacher makes me feel I'm O.K. ______

50. (a) I don't care what happens to me. ______
(b) I care what happens to me. ______

51. (a) I'm a failure. I can't do anything right. ______
(b) I'm not a failure. I can do a lot of things right. ______

52. (a) I get upset easily when I'm scolded. ______
(b) I don't get upset easily when I'm scolded. ______

53. (a) Most people are better like than I am. ______
(b) I'm as well like as most people. ______

54. (a) I usually feel as if my parents are pushing me. ______
(b) I don't feel that my parents are pushing me. ______

55. (a) I always, always know what to say to people. ______
(b) Sometimes I don't know what to say to people. ______

56. (a) I often get discouraged in school. School often seems hopeless to me. ______
(b) I don't get discouraged in school. School doesn't seem hopeless to me. ______

57. (a) Things usually don't bother me. ______
(b) Things usually bother me. ______

58. (a) I can't be depended on. I can't be trusted to do the things I say I'm going to do. ______
(b) I can be depended on. I can be trusted to do the things I say I'm going to do. ______

Section 3

Factor Loading Matrix of the Four Factor Solution, Varimax Rotation, Self-Esteem Inventory

(H**2 = Communalities)

Test Item	H**2	1	2	3	4	H**2
1	0.326	0.347	-0.147	-0.022	0.428	0.326
2	0.250	-0.199	0.283	0.022	0.360	0.250
3	0.156	0.170	-0.183	0.304	0.029	0.156
4	0.387	0.159	0.599	-0.006	0.048	0.387
5	0.275	0.280	0.403	0.181	0.045	0.275
7	0.372	-0.047	0.439	0.421	-0.011	0.372
8	0.081	0.034	-0.075	0.235	0.137	0.081
9	0.157	0.104	0.187	0.334	-0.004	0.157
10	0.285	0.018	0.332	0.149	0.391	0.285
11	0.491	0.250	0.627	0.051	0.179	0.491
12	0.281	0.188	0.056	0.492	0.016	0.281
14	0.337	0.144	0.039	-0.114	0.549	0.337
15	0.233	0.188	0.098	-0.035	0.432	0.233
16	0.327	-0.073	0.003	0.418	0.383	0.327
17	0.290	0.451	0.033	-0.189	0.222	0.290
18	0.342	0.201	0.502	-0.135	0.179	0.342
19	0.189	0.273	0.232	-0.070	-0.237	0.189
21	0.410	0.454	0.094	-0.376	0.233	0.410
22	0.225	-0.045	-0.188	0.192	0.388	0.225
23	0.141	-0.071	0.179	0.317	-0.053	0.141
24	0.475	0.227	0.552	0.011	-0.344	0.475
25	0.249	-0.008	0.072	0.029	0.493	0.249
26	0.260	0.500	0.072	0.068	-0.019	0.260
28	0.112	0.183	0.237	0.143	0.041	0.112
29	0.244	-0.006	0.211	0.047	0.444	0.244
30	0.329	0.343	0.024	0.385	0.252	0.329
31	0.496	0.493	0.049	0.499	0.043	0.496
32	0.234	0.089	0.084	0.409	0.228	0.234
33	0.373	0.540	0.282	0.030	-0.034	0.373
35	0.247	0.349	0.131	-0.042	0.325	0.247
36	0.295	-0.128	0.482	0.004	0.216	0.295
37	0.230	-0.046	-0.032	0.466	-0.100	0.230
38	0.426	0.541	0.214	0.286	0.078	0.426
39	0.331	0.200	-0.134	0.442	-0.277	0.331
40	0.448	0.655	0.088	0.096	0.051	0.448

Cont.

Test Item	H**2	1	2	3	4	H**2
42	0.571	0.404	0.052	0.607	0.191	0.571
43	0.428	0.487	0.190	0.288	0.269	0.428
44	0.148	0.179	0.340	0.025	0.001	0.148
45	0.377	-0.085	0.455	0.343	0.213	0.377
46	0.370	0.348	0.292	0.358	0.187	0.370
47	0.339	0.417	0.375	-0.143	-0.066	0.339
49	0.295	0.452	0.172	0.234	-0.080	0.295
50	0.261	0.419	0.271	0.092	-0.058	0.261
51	0.415	0.551	0.204	0.236	0.119	0.415
52	0.223	0.329	0.162	0.296	0.042	0.223
53	0.217	0.144	0.342	0.281	-0.021	0.217
54	0.558	0.706	0.053	0.143	-0.192	0.558
56	0.506	0.600	-0.262	0.088	0.264	0.506
57	0.149	0.079	0.349	-0.028	0.142	0.149
58	0.257	0.490	0.044	0.095	0.081	0.257
Variance		5.573	3.789	3.437	3.026	
% Total Variance		10.927%	7.428%	6.739%	5.934%	
% Common Variance		35.215%	23.941%	21.720%	19.124%	

Sum of Communalities = 15.825

Total Variance accounted for = 31.029%

Section 4

Factor Loading Matrix of the Five Factor Solution, Varimax Rotation, Self-Esteem Inventory

(H**2 = Communalities)

Test Item	H**2	1	2	3	4	5	H**2
1	0.349	0.085	0.222	0.083	-0.085	0.527	0.349
2	0.258	-0.105	0.034	0.491	-0.062	-0.029	0.258
3	0.184	0.078	0.375	-0.178	-0.020	0.076	0.184
4	0.418	0.310	-0.114	0.454	0.305	-0.097	0.418
5	0.275	0.314	0.155	0.252	0.299	-0.003	0.275
7	0.420	0.026	0.391	0.251	0.362	-0.267	0.420
8	0.085	0.018	0.276	0.019	-0.082	0.027	0.085
9	0.399	-0.077	0.479	-0.009	0.405	0.016	0.399
10	0.286	0.062	0.193	0.490	0.034	0.060	0.286
11	0.494	0.312	0.028	0.516	0.360	0.031	0.494
12	0.284	0.246	0.457	0.002	0.055	-0.107	0.284
14	0.341	-0.034	0.101	0.349	-0.103	0.444	0.341
15	0.272	0.193	0.022	0.365	-0.173	0.267	0.272
16	0.368	-0.120	0.543	0.222	-0.089	0.044	0.368
17	0.365	0.113	0.064	0.021	0.229	0.543	0.365
18	0.343	0.181	-0.101	0.427	0.313	0.137	0.343
19	0.286	0.093	0.005	-0.122	0.502	0.098	0.286
21	0.414	0.195	-0.188	0.120	0.158	0.549	0.414
22	0.305	0.081	0.172	0.204	-0.474	0.055	0.305
23	0.141	0.054	0.234	0.096	0.097	-0.254	0.141
24	0.484	0.265	-0.086	0.085	0.606	-0.178	0.484
25	0.253	-0.030	0.134	0.392	-0.187	0.214	0.253
26	0.260	0.410	0.098	-0.057	0.172	0.222	0.260
28	0.221	0.025	0.265	0.078	0.364	0.107	0.221
29	0.246	-0.052	0.166	0.429	-0.015	0.178	0.246
30	0.344	0.257	0.483	0.091	0.032	0.188	0.344
31	0.512	0.574	0.427	0.001	0.007	0.018	0.512
32	0.254	0.072	0.472	0.159	0.028	0.013	0.254
33	0.401	0.561	-0.029	0.109	0.229	0.143	0.401
35	0.248	0.246	0.066	0.249	0.027	0.347	0.248
36	0.404	0.133	-0.139	0.575	0.001	-0.190	0.404
37	0.446	0.352	0.169	0.030	-0.319	-0.437	0.446
38	0.453	0.598	0.229	0.135	0.115	0.107	0.453
39	0.393	0.424	0.224	-0.254	-0.125	-0.287	0.393
40	0.467	0.453	0.212	-0.060	0.270	0.374	0.467
42	0.587	0.370	0.660	0.056	0.071	0.084	0.587
43	0.471	0.318	0.439	0.169	0.232	0.308	0.471
44	0.193	0.081	0.092	0.150	0.389	0.071	0.193

Cont.

Test Item	H**2	1	2	3	4	5	H**2
45	0.378	0.074	0.288	0.473	0.146	-0.211	0.378
46	0.370	0.381	0.358	0.262	0.159	0.055	0.370
47	0.341	0.325	-0.117	0.124	0.417	0.181	0.341
49	0.458	0.668	0.033	0.075	-0.010	-0.075	0.458
50	0.350	0.561	-0.050	0.138	0.116	-0.007	0.350
51	0.480	0.635	0.163	0.176	0.046	0.131	0.480
52	0.231	0.394	0.242	0.098	0.086	0.002	0.231
53	0.366	0.027	0.372	0.103	0.465	-0.021	0.366
54	0.564	0.566	0.167	-0.242	0.316	0.239	0.564
56	0.522	0.322	0.297	-0.147	-0.058	0.552	0.522
57	0.150	0.100	-0.021	0.324	0.182	0.037	0.150
58	0.424	0.617	-0.021	0.087	-0.135	0.130	0.424
Variance		5.126	3.604	3.485	2.988	2.771	
% Total Variance		10.050%	7.067%	6.833%	5.859%	5.434%	
% Common Variance		28.516%	20.053%	19.389%	16.624%	15.418%	

Sum of Communalities = 17.974

Total Variance Accounted for 35.244%

Section 5

Table F-5-1

Transformation Matrix[1] of the Procrustes Solution to the Four Factor Grade One Self-Esteem Inventory Rotated to Match the Grade Three and Six Solution

Grade One Factors	Grades 3 + 6 Factors 1	2	3	4
1	0.9766	0.1871	-0.0111	0.1052
2	0.1797	-0.5229	0.4690	-0.6887
3	-0.0941	0.3881	0.8742	0.2761
4	-0.0710	0.7355	-0.1251	-0.6621

---

[1] Table entries are cosines of angles through which the grade one factors were rotated to best fit the grade 3 + 6 factors, a perfect fit being 1.0.

Table F-5-2

Matrix of Tucher Coefficients of Congruence for the Grade 3 + 6 Self-Esteem Inventory Matrix and the Rotated Grade 1 Matrix

	1	2	3	4
1	0.9139	0.0868	0.0086	0.1203
2	0.0786	0.4803	0.0953	-0.0518
3	0.0080	0.0981	0.1615	-0.0173
4	0.1168	-0.0556	-0.0181	0.0688

Appendix G

My Class Inventory

Section 1. Grade Three and Six Instrument

Section 2. Grade One Instrument

Section 3. Factor Loading Matrix, Five Factor Solution, Grades Three and Six

Section 4. Factor Loading Matrix, Five Factor Solution, Grades One, Three and Six

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MY CLASS, an instrument developed at Harvard University by Gary J. Anderson and Herbert J. Walberg, May 1968. Revised, January 1969, by G.J. Anderson and Ronald E. Cayne, Faculty of Education, McGill University. (Grade Three and Six Instrument)

MY CLASS, and instrument developed at Harvard University by Gary J. Anderson and Herbert J. Walberg, May 1968. Revised, January 1969, by G.J. Anderson and Ronald E. Cayne, Faculty of Education, McGill University. (Grade One Instrument)

This format was developed by Gary J. Anderson of McGill University, and Herbert J. Walberg of Harvard University, April 1969.

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Section 3

Factor Loading Matrix of the Five Factor Solution Varimax Rotation, My Class Inventory, Grades Three and Six

(H**2 = Communalities)

Factor Test	H**2	1	2	3	4	5	H**2
1	0.313	0.479	-0.069	0.086	0.237	-0.124	0.313
2	0.372	-0.126	0.064	-0.159	0.568	0.065	0.372
3	0.174	-0.344	-0.093	0.017	0.073	-0.204	0.174
4	0.429	-0.147	0.045	0.593	0.154	0.172	0.429
5	0.173	0.015	-0.139	0.322	-0.107	-0.196	0.173
6	0.218	0.087	0.315	-0.067	0.295	0.141	0.218
7	0.264	0.491	-0.066	0.135	-0.027	-0.009	0.264
8	0.205	-0.007	0.178	-0.044	0.393	-0.130	0.205
9	0.262	0.220	0.220	0.122	-0.066	-0.382	0.262
10	0.304	-0.023	-0.045	-0.113	-0.018	0.537	0.304
11	0.318	0.397	-0.384	0.043	0.103	-0.025	0.318
12	0.378	-0.212	-0.346	0.175	0.427	-0.020	0.378
13	0.350	-0.143	0.133	-0.008	0.547	0.112	0.350
14	0.419	-0.306	-0.113	0.266	0.446	-0.208	0.419
15	0.293	0.143	-0.267	0.404	-0.012	-0.194	0.293
16	0.394	0.619	-0.070	-0.012	-0.019	-0.074	0.394
17	0.277	-0.043	0.445	-0.178	0.109	0.182	0.277
18	0.165	0.045	0.330	0.033	0.196	-0.123	0.165
19	0.074	0.136	0.190	0.106	-0.080	-0.044	0.074
20	0.114	-0.004	0.145	-0.253	-0.031	0.168	0.114
21	0.358	0.585	-0.033	0.102	-0.008	-0.069	0.358
22	0.244	-0.275	0.321	-0.229	-0.021	-0.110	0.244
23	0.086	0.121	0.250	-0.050	0.075	-0.036	0.086
24	0.298	0.015	0.207	0.438	0.083	0.237	0.298
25	0.101	0.046	-0.041	0.062	0.302	0.041	0.101
26	0.231	-0.033	0.370	-0.188	0.119	0.209	0.231
27	0.269	0.185	-0.429	-0.136	-0.175	-0.038	0.269
28	0.123	0.048	0.090	0.327	0.038	-0.064	0.123
29	0.448	-0.236	0.065	0.379	0.404	-0.285	0.448
30	0.335	-0.206	0.434	0.123	0.298	-0.007	0.335
31	0.428	0.601	-0.064	0.174	-0.132	0.123	0.428
32	0.314	-0.004	0.477	0.082	0.255	0.120	0.314
33	0.353	0.144	-0.112	0.540	-0.042	-0.162	0.353
34	0.279	-0.129	-0.239	-0.024	-0.121	0.436	0.279
35	0.265	0.035	0.463	0.026	0.013	-0.220	0.265
36	0.393	0.367	-0.482	-0.156	0.033	-0.034	0.393

Cont.

Factor Test	H**2	1	2	3	4	5	H**2
37	0.521	-0.059	0.020	-0.003	0.719	-0.027	0.521
38	0.451	0.122	-0.089	0.600	-0.024	-0.260	0.451
39	0.126	-0.260	-0.021	0.103	0.124	0.179	0.126
40	0.469	0.003	0.145	0.611	0.102	0.254	0.469
41	0.412	-0.117	0.553	-0.205	-0.156	-0.161	0.412
42	0.152	0.077	0.176	-0.012	0.336	-0.046	0.152
43	0.351	0.559	0.067	0.011	-0.181	-0.023	0.351
44	0.037	0.045	0.039	-0.027	0.001	0.180	0.037
45	0.247	0.164	-0.001	0.414	-0.177	-0.135	0.247
Variance		2.979	2.815	2.809	2.662	1.524	
% Total Variance		6.620%	6.255%	6.242%	5.915%	3.386%	
% Common Variance		23.294%	22.011%	21.966%	20.815%	11.914%	

Sum of Communalities = 12.788

Total Variance Accounted for = 28.418%

Section 4

Factor Loading Matrix of the Five Factor Solution
Varimax Rotation, My Class Inventory,
Grades One, Three and Six

(H**2 = Communalities)

Factor Test	H**2	1	2	3	4	5	H**2
1	0.459	0.618	-0.012	0.012	0.277	0.023	0.459
2	0.382	-0.099	0.366	-0.322	0.346	0.120	0.382
3	0.258	-0.409	-0.123	0.023	0.274	-0.030	0.258
4	0.434	-0.261	-0.055	0.358	0.296	0.385	0.434
5	0.302	-0.033	-0.100	0.445	-0.283	-0.112	0.302
6	0.325	-0.004	0.516	-0.240	0.012	-0.004	0.325
7	0.363	0.566	-0.121	0.143	0.074	-0.036	0.363
8	0.410	0.098	0.355	0.023	0.523	-0.018	0.410
9	0.423	0.195	0.085	0.245	-0.050	-0.562	0.423
10	0.582	0.055	0.244	-0.209	-0.511	0.464	0.582
11	0.433	0.565	-0.232	0.103	0.083	0.208	0.433
12	0.485	-0.193	0.519	0.088	0.413	0.010	0.485
13	0.293	-0.122	0.364	-0.272	0.245	0.111	0.293
14	0.366	-0.400	0.081	0.139	0.390	0.168	0.366
15	0.418	0.131	-0.332	0.510	0.156	0.076	0.418
16	0.454	0.635	-0.105	-0.047	0.110	-0.158	0.454
17	0.378	-0.092	0.587	-0.114	-0.013	-0.108	0.378
18	0.246	0.026	0.121	-0.021	0.474	-0.072	0.246
19	0.319	0.130	0.205	0.307	-0.392	-0.110	0.319
20	0.217	0.019	0.164	-0.426	-0.067	0.060	0.217
21	0.454	0.651	-0.040	0.062	0.014	-0.159	0.454
22	0.401	-0.281	0.097	-0.407	-0.048	-0.381	0.401
23	0.274	0.181	0.433	0.201	-0.025	-0.116	0.274
24	0.345	-0.105	0.378	0.357	0.128	0.218	0.345
25	0.256	0.077	0.007	-0.004	0.464	0.188	0.256
26	0.154	-0.085	0.216	-0.315	0.026	-0.021	0.154
27	0.425	0.333	-0.535	0.080	-0.129	0.070	0.425
28	0.329	0.014	0.293	0.491	-0.047	0.004	0.329
29	0.303	-0.263	0.137	0.318	0.336	-0.033	0.303
30	0.533	-0.233	0.629	0.039	0.242	-0.150	0.533
31	0.434	0.586	0.024	0.187	-0.228	-0.050	0.434
32	0.391	-0.101	0.603	-0.062	0.107	-0.043	0.391
33	0.411	0.097	-0.019	0.630	0.058	0.036	0.411
34	0.427	-0.084	-0.150	-0.158	-0.109	0.600	0.427
35	0.308	0.034	0.071	0.044	0.381	-0.394	0.308
36	0.404	0.565	-0.222	-0.035	0.002	0.187	0.404

Cont.

Factor Test	H**2	1	2	3	4	5	H**2
37	0.403	-0.013	0.426	-0.213	0.410	0.089	0.403
38	0.410	0.052	-0.111	0.628	-0.024	0.006	0.410
39	0.190	-0.247	0.143	0.131	0.144	0.265	0.190
40	0.437	-0.041	0.251	0.396	0.161	0.436	0.437
41	0.503	-0.159	0.288	-0.166	-0.131	-0.591	0.503
42	0.261	0.020	0.134	-0.048	0.486	-0.067	0.261
43	0.520	0.708	0.013	0.046	-0.115	-0.053	0.520
44	0.255	0.129	0.288	0.009	-0.246	0.308	0.255
45	0.396	0.008	0.041	0.606	-0.144	-0.077	0.396
Variance		4.071	3.727	3.538	3.002	2.433	
% Total Variance		9.046%	8.282%	7.863%	6.671%	5.407%	
% Common Variance		24.273%	22.221%	21.098%	17.899%	14.509%	

Sum of Communalities = 16.771

Total Variance Accounted for = 37.270%

Appendix H

Section 1. Correlations between pupil formative experiences and selected teacher-pupil dyadic interaction.

Section 2. Correlations between pupil properties and selected teacher-pupil dyadic interaction.

Section 3. Weights assigned twelve set A pupil charactertistic predictor variables and twelve set B interaction variables in a canonical correlation involving all variables in this study.

Section 1-a

Zero Order Correlations between Age in Months and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	.004	.319	.081	.155	-.461	.216	.411	.390	-.005	.233	.224	-.025
2-1	.040	-.081	.326	-.266	-.011	-.052	-.308	-.022	.014	.027	.402	.175
1-3	-.026	-.008	-.142	-.119	.102	.034	.120	-.177	-.159	.111	-.082	-.134
2-3	.124	.296	.172	-	.293	.135	.352	-.325	.350	-.047	-	.041
1-6	-.494	.091	.120	-.150	.078	-.018	-.016	.166	.020	-.240	-	-
2-6	.157	.139	-.119	-.075	.027	.192	-.119	.154	.002	-	-	-

Section 1-b

Zero Order Correlations between Pupil Sex and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	-.276[A]	-.373	-.389	-.269	-.474	-.518	-.443	-.379	-.228	-.368	.224	-.025
2-1	-.663	-.266	-.599	-.072	-.312	-.173	-.109	-.100	-.358	-.213	-.213	.015
1-3	-.141	-.078	-.480	-.230	-.049	-.461	-.086	-.306	-.237	.145	-.103	-.310
2-3	-.088	-.269	.157	-	-.463	-.543	.269	.023	-.145	-.169	-	-.424
1-6	-.291	-.188	-.346	.221	-.386	-.319	-.228	.080	-.217	-.115	-	-
2-6	-.361	.236	-.256	-.001	.238	-.034	-.118	-.148	.030	-	-	-

A: Boys were coded =1, girls =2, therefore greater interaction frequency for boys gives a negative correlation.

Section 1-c

Zero Order Correlations between Sibling Position[1] and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	-.241	-.066	-.050	.165	.000	.071	.079	.014	-.001	.067	.104	.420
2-1	-.302	-.543	.054	-.576	-.032	-.164	-.366	-.554	-.409	-.301	.107	.007
1-3	-.311	-.086	.157	.092	-.106	.025	-.340	.256	-.079	.311	.002	-.084
2-3	-.371	-.473	.172	-	-.064	-.156	-.178	-.113	-.290	-.125	-	-.191
1-6	.035	-.235	.223	-.186	.021	-.186	-.383	-.341	-.058	-.145	-	-
2-6	-.389	.100	-.020	.243	.546	-.013	-.015	-.059	-.013	-	-	-

---

[1] 1 = only child, 2 = oldest, 3 = youngest, 4 = middle of a small family, 5 = middle of a large family (5 or more)

Section 2-a

Zero Order Correlations between Sociometric Status and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	.309	-.080	.182	.665	.225	-.043	-.030	-.049	.045	-.106	.010	-.063
2-1	-.017	.008	-.186	-.180	-.194	-.048	-.279	-.404	-.299	-.210	-.054	.523
1-3	-.217	-.156	.114	.359	.047	.227	-.010	-.064	.202	.112	.693	-.068
2-3	-.143	-.080	-.076	-	-.284	-.338	-.193	.037	.230	-.281	-	-.171
1-6	-.186	-.045	-.425	.466	-.133	.046	-.052	.063	-.260	-	-	-
2-6	.254	.386	.055	.258	.176	-.306	.115	.344	.421	-	-	-

Section 2-b

Zero Order Correlations between Ability and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	.192	.081	.285	.311	.287	.075	.045	.126	-.095	.171	.043	.003
2-1	.400	.434	.000	.170	-.089	.274	-.082	.164	.217	.038	-.054	.523
1-3	.300	.279	-.192	-.209	-.042	.311	-.063	.213	-.267	.013	.278	.213
2-3	-.086	-.105	-.214	-	-.536	-.303	-.386	.001	-.079	-.352	-	-.065
1-6	.818	.377	.197	-.031	.465	.422	-.086	-.020	.441	-	-	-
2-6	-.167	.096	-.239	-.206	-.015	-.317	-.154	-.344	-.110	-	-	-

Section 2-c

Zero Order Correlations between Self Esteem and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see Table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	.022	.209	-.011	.193	-.027	.070	.223	.101	-.278	.129	.152	-.040
2-1	-.502	-.095	-.509	-.186	-.030	-.308	.313	.030	-.368	-.236	.038	.250
1-3	.226	.199	.025	.231	-.159	-.101	-.412	-.288	.004	.152	-.133	.098
2-3	.001	-.467	.078	-	-.367	-.686	-.115	-.267	-.072	-.315	-	-.641
1-6	.090	-.395	-.124	.016	-.176	-.156	-.116	-.202	-.222	-	-	-
2-6	-.028	.043	-.047	.068	-.098	-.003	.180	-.322	-.104	-	-	-

Section 2-d

Zero Order Correlations between Attitude to School and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	-.249	-.313	-.266	-.246	-.297	-.440	-.381	-.380	-.497	-.372	.325	-.117
2-1	-.462	-.417	-.020	-.046	-.072	-.437	.321	.137	.024	.180	-.129	-.499
1-3	.058	.112	-.078	.010	-.376	.067	.142	-.389	.001	-.227	.051	.455
2-3	.003	-.385	.204	-	-.489	-.641	-.425	-.055	-.179	-.376	-	-.505
1-6	.067	-.315	-.191	.262	-.145	-.194	-.394	-.221	-.218	-	-	-
2-6	.118	.367	-.371	.015	-.109	.164	-.092	-.377	-.031	-	-	-

Section 2-e

Zero Order Correlation between Prior Achievement and Frequency of Dyadic Interaction

Class	Set B Interaction Variables (see table 2)											
	18	27	28	29	30	35	39	43	191	192	193	194
1-1	.292	.319	-.332	-.051	.086	-.034	.108	.272	-.060	-.208	-.315	-.234
2-1	.313	.345	-.193	.243	-.232	.301	-.240	-.110	-.085	-.183	-.002	.140
1-3	.099	.206	-.073	-.007	-.062	.024	-.285	-.071	-.405	.200	.287	-.032
2-3	.071	.137	-.229	-	-.354	-.172	-.272	-.204	-.078	-.260	-	-.008
1-6	.648	.287	.196	-.057	.357	.147	.203	.270	.453	-	-	-
2-6	-.003	.189	.010	-.457	-.142	.004	.188	-.466	-.130	-	-	-

Section 3

Weights Assigned Predictor Variables and Criterion Variables in the Canonical Correlation of Twelve Pupil Characteristics and Teacher-Pupil Interaction

Set A Variables	Grade		
	1	3	6
Age	-0.08	0.02	.02
Sex	0.62*	0.10	-0.62*
Socioeconomic Status	0.26	-0.48*	0.24
Sibling Position	0.05	0.01	-0.33**
Family Integrity	-0.07	0.26	-
Sociometric Status	0.50*	-0.22	-0.07
Ability	-0.37**	0.46*	-0.27
Self-Esteem	0.01	0.33**	0.07
Attitude	0.32	-0.13	-0.26
Prior Achievement	-0.18	0.03**	0.54*
Behavior (T.D.)	-0.03	0.55*	0.01
Behavior (N.T.D.)	-0.12	-0.03**	0.03
Set B Variables			
18	-0.65*	-0.12**	0.60*
27	-0.34*	0.47*	-0.30*
28	-0.18	-0.52*	0.30**
29	0.28	-	-0.21**
30	0.02	-0.19**	-0.15**
35	-0.03	0.15	0.20
39	0.12	-0.26**	0.60*
43	-0.19	0.14	-0.02**
191	-0.04	-0.01	-0.008
192	-0.54*	-0.22	-
193	-0.10	-	-
194	-0.05	-0.55*	-

* Best predictor due to high weight

** Best predictor identified by high correlation between this variable and the composite